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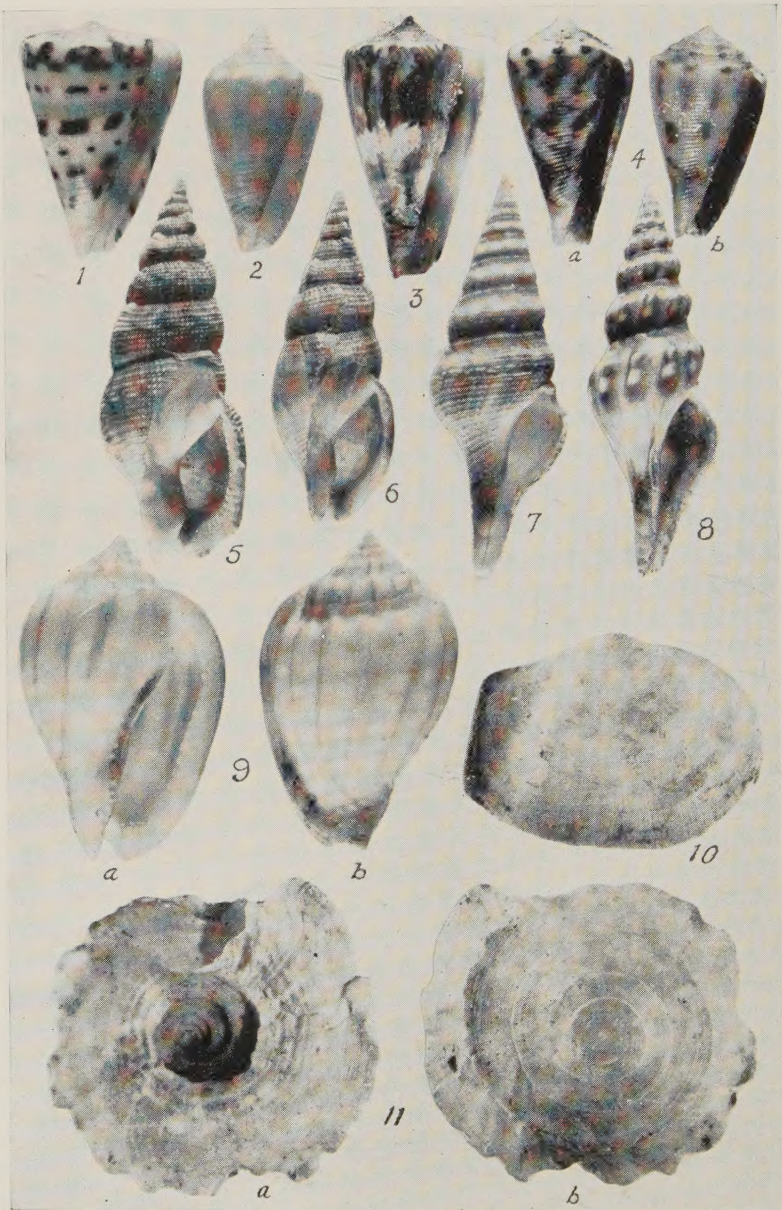


PLATE 1.

Fig. 1: *Rhizoconus advertex* Garrard. Holotype. Aust. Mus. C. 63348. Mag. X1.

Fig. 2: *Leptoconus illawarra* Garrard. Holotype. Aust. Mus. C. 63349. Mag. X1.

MOLLUSCA COLLECTED BY m.v. "CHALLENGE" OFF THE EAST COAST OF AUSTRALIA

By T. A. GARRARD.*

SUMMARY.

A systematic list of the mollusca obtained during the prawn surveys carried out off the east coast of Australia by m.v. "Challenge" on behalf of the Commonwealth Fisheries Office is given; sixteen new species are described, and three new generic names are introduced.

INTRODUCTION.

A survey of the eastern coast of Australia covering most of the continental shelf and also parts of the continental slope down to 170 fathoms, was carried out by m.v. "Challenge" in a search for new prawning grounds from July to December 1957, February to August 1958, February to August 1959, and November 1959 to May 1960, under the auspices of the Commonwealth Fisheries Office, Canberra.

The area covered extended from Bass Strait to Cairns in Queensland, and unfortunately it is understood that no new prawning grounds of any consequence were discovered. However the quantity of marine life brought up by the nets was considerable, and it is a matter for great regret that two or three scientific workers were not on board throughout the surveys for the purpose of general collecting.

Unfortunately the author had no knowledge of the undertaking until the third survey was well under way, and therefore the bulk of the material obtained came from the area covered between Newcastle and Port Kembla, when the vessel berthed on several occasions in Port Jackson. Very little co-operation was obtained in securing material, and despite promises the fourth survey yielded only a handful of shells. However Dr. Racek of the Department of Zoology, Sydney University, spent a short period on board and managed to obtain some useful specimens, and some others have been obtained through the agency of Mr. D. Gates, all of which have been shared between the Australian Museum, Sydney, and the National Museum of Victoria, Melbourne. It was considered that the

*3 The Circle, Dundas, N.S.W.

Fig. 3: *Floraconus wallangra* Garrard. Holotype. Aust. Mus. C. 63323. Mag. X1.

Figs. 4a, 4b: *Mamiconus minnamurra* Garrard. Holotype. Aust. Mus. C. 63350 (a), and paratype (b). Mag. X1.

Fig. 5: *Colubraria fantomei* Garrard. Holotype. Aust. Mus. C. 63346. Mag. X2/3.

Fig. 6: *Colubraria myuna* Garrard. Holotype. Aust. Mus. C. 63347. Mag. X1.

Fig. 7: *Turris binda* Garrard. Holotype. Aust. Mus. C. 63351. Mag. X2/3.

Fig. 8: *Turricula murrayolga* Garrard. Holotype. Aust. Mus. C. 63352. Mag. X1.

Figs. 9a, 9b: *Pulchroniscia delecta* Garrard. Holotype. Aust. Mus. C. 63343. Mag. X1.

Fig. 10: *Thracidentula perulae* Garrard. Holotype. Aust. Mus. C. 63340. Mag. X1.

Figs. 11a, 11b: *Russetia dilaniatus* Garrard. Holotype. Aust. Mus. C. 63345. Mag. X1.

quantity secured warranted the compilation of a systematic list in order to give a better idea of the distribution of some of the species found and add further data regarding some of them, whilst the discovery of no less than sixteen new species has given considerable added value to this record. All localities mentioned are indicated in the map on page 37.

The systematic arrangement here followed is largely that used in the "Reference List of the Marine Mollusca of New South Wales" by Tom Iredale and Donald F. McMichael, at present in press, and to a manuscript copy of which the present author had access, and thanks are extended to them for their invaluable assistance in searching records and checking of references.

SYSTEMATIC LIST OF SPECIMENS

CLASS PELECYPODA (LAMELLIBRANCHIA)

SUBCLASS PRIONODESMACEA

FAMILY NUCULIDAE

ENNUCULA Iredale 1931, Rec. Aust. Mus. 18, p. 202, type species by original designation *obliqua* Lamarck.

obliqua Lamarck 1819, Hist. Anim. s. Vert., 6 (1), p. 59.

One live specimen in 65 fathoms east of Broken Bay.

FAMILY LIMOPSIDAE

VERSIPELLA Iredale 1931, Rec. Aust. Mus., 18, p. 203, type species by original designation *soboles* Iredale.

soboles Iredale 1931, Rec. Aust. Mus., 18, p. 203.

Two single valves in 90-100 fathoms east of Tuggerah; one live specimen off Broken Bay; ten live specimens east of Botany Bay in 60 fathoms; three live specimens in 45-75 fathoms east of Port Kembla.

SENECTIDENS Iredale 1931, Rec. Aust. Mus., 18, p. 204, type species by original designation *dannevigi* Iredale.

dannevigi Iredale 1931, Rec. Aust. Mus., 18, p. 204.

Ten live specimens in 160 fathoms east of Newcastle; eight live specimens in 75 fathoms east of Broken Bay; five live specimens in 60 fathoms east of Stanwell Park.

FAMILY ARCIDAE

DESTACAR Iredale 1936, Rec. Aust. Mus., 19, pp. 268, 334, type species by original designation *metella* Hedley.

metella Hedley 1917, Proc. Linn. Soc., N.S.W., 41, p. 681, pl. 51, figs. 36, 37.

One live specimen off Broken Bay; a quantity of live specimens in 45 fathoms east of Botany Bay.

FAMILY GLYCYMERIDAE

VELETUCETA Iredale 1931, Rec. Aust. Mus., 18, p. 203, type species by original designation *flammea* Reeve.

thackwayi Iredale 1931, Rec. Aust. Mus., 18, p. 203.

One live specimen in 50 fathoms east of Botany Bay.

FAMILY TRIGONIIDAE

NEOTRIGONIA Cossman 1912, Ann. Paleont., 7, p. 81, type species by monotypy *margaritacea* Lamarck.

lamarckii Gray 1838, Ann. Nat. Hist., (1), p. 482.

Two live specimens in 45 fathoms east of Broken Bay; one live specimen in 37-40 fathoms east of Barrenjoey Light; two single valves in 50 fathoms east of Botany Bay.

gemma Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 193, pl. 33, figs. 1, 2, Pl. 35, f. 1.

Nine single valves in 45 fathoms east of Broken Bay.

FAMILY PECTINIDAE

MESOPEPLUM Iredale 1929, Rec. Aust. Mus., 17, p. 162, type species by original designation *caroli* Iredale.

caroli Iredale 1929, Rec. Aust. Mus., 17, p. 162, pl. 38, f. 7-9.

A number of live specimens taken in depths from 25 to 60 fathoms from Newcastle Bight to Bass Strait.

MIMACHLAMYS Iredale 1929, Rec. Aust. Mus., 17, p. 162, type species by original designation *asperrima* Lamarck.

asperrima Lamarck 1819, Hist. Anim. s. Vert., 6 (1), p. 174.

One live specimen in 30 fathoms east of Twofold Bay.

NOTOVOLA Finlay 1926, Trans. New Zeal. Inst., 57, p. 451, type species by monotypy *novaezealandiae* Reeve.

fumata Reeve 1852, Conch. Icon., 8, pl. 9, f. 32.

Fairly plentiful in all depths up to 100 fathoms, and on all parts of the coast from Port Stephens southward to Bass Strait.

FAMILY AMUSIIDAE

AMUSIUM Röding 1798, Mus. Bolten, pt. 2, p. 165, type species by tautonymy *pleuronectes* Linne.

ballotti Bernardi 1861, J. de Conch., 9, p. 46, pl. 1, f. 1.

One live specimen in 27-35 fathoms east of Broken Bay; considerably darker red in colour than specimens commonly found in southern Queensland.

FAMILY DIMYIDAE

DIMYARINA Iredale 1936, Rec. Aust. Mus., 19, p. 269, type species by original designation *corrugata* Hedley.

corrugata Hedley 1902, Mem. Aust. Mus., 4, p. 308, f. 52.

Found alive in fair numbers in 40-50 fathoms east of Botany Bay.

FAMILY OSTREIDAE

OSTREA Linne 1758, Syst. Nat. ed. 10, p. 696, type species by subsequent designation (Gray 1847, Proc. Zool. Soc. Lond. 1847, p. 201) *edulis* Linne.

? *nomades* Iredale 1939, Great Barrier Reef Exp., p. 395, pl. 7, f. 1, 1a, 1b.

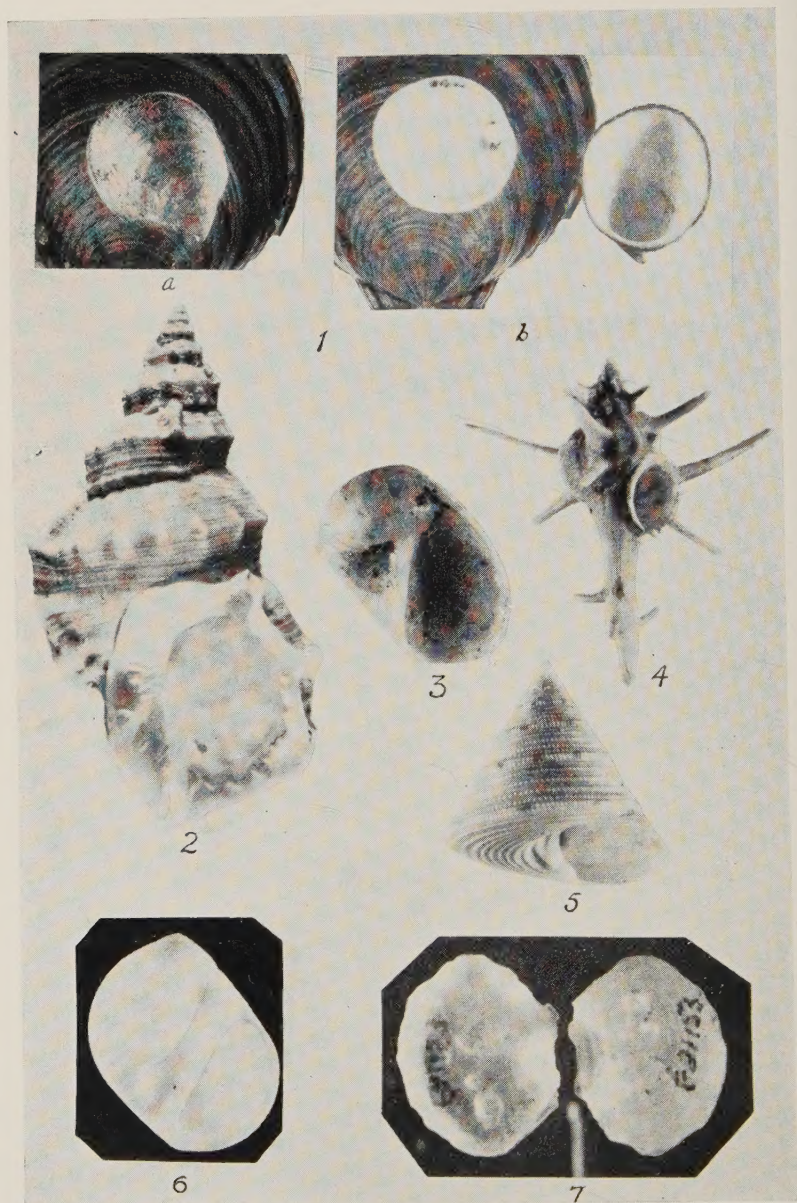


PLATE 2.

Fig. 1a, 1b: *Carulus sycophanta* Garrard. Holotype. Aust. Mus. C. 63342. Mag. $X\frac{1}{2}$.

Fig. 2: *Bursa latitudo* Garrard. Holotype. Nat. Mus. Vic. F. 21111. Mag. $X\frac{2}{3}$.

A small specimen from deep water N.N.E. of Cape Byron, 24 mm. long, 21 mm. from umbo to farthest point of ventral margin, 5 mm. in section, is more than usually light and frail for this species, but owing to the inherent risk in naming a new species of such variable shells as the genus *Ostrea*, the specimen obtained is catalogued herein until further material can be obtained. It varies in many ways from *nomades* Iredale, notably by total absence of any greenish colouring or green muscle scar, presence of fine reddish lines on the fairly flat upper valve, and considerably lighter construction generally. This appears to be the "small white oyster" to which Iredale refers in the two final paragraphs of his description of *nomades*, but the illustration shown at Pl. 7, f. 1a, is a typical *nomades* and not this flatter and frailer form.

Description: Shell small, adherent, frail, translucent, inequilateral; upper valve slightly convex with crenulated margins, lower valve flat with vertically raised ventral margin; sculpture consists only of irregular concentric growth striae; hinge line long and narrow; muscle scar very small; colouration off-white with extremely fine broken irregular lines of reddish orange radiating from umbo to ventral margin on upper valve only.

Specimen described is in possession of the National Museum of Victoria, Melbourne, where it is registered No. F. 21153.

FAMILY MYTILIDAE

MODIOLUS Lamarck 1799, Mem. Soc. Nat. Hist. Paris, p. 87, type species by monotypy *modiolus* Linne.

peronianus Laseron 1956, Aust. Zool., 12, p. 269, f. 22-24.

One live specimen east of Bermagui.

SUBCLASS ANOMALODESMACEA

FAMILY THRACIIDAE

THRACIDENTULA gen. nov.

This new genus is created for a shell having, apart from the main characteristics of the family, an internal calcified ligament or lithodesma.

Generic description is: Shell oblong, equilateral, ventricose, gaping posteriorly; anterior dorsal margin concave, posterior dorsal margin convex, tapering more anteriorly than posteriorly; right valve slightly overlapping left at posterior dorsal margin; whole shell covered with small elevated granules arranged radially; valves joined internally by a calcified ligament or lithodesma.

PLATE 2—Continued.

Fig. 3: *Propesinum umbilicatum minusculum* Iredale. Aust. Mus. C. 63354. Mag. X2.

Fig. 4: *Poirieria kurranulla* Garrard. Holotype. Nat. Mus. Vic. F. 21118. Mag. X1.

Fig. 5: *Astele bularra* Garrard. Holotype. Aust. Mus. C. 63341. Mag. X1.

Fig. 6: *Polinices putealis* Garrard. Holotype. Aust. Mus. C. 63344. Mag. X1.

Fig. 7: *Ostrea* ? *nomades* Iredale. Nat. Mus. Vic. F. 21153. Mag. X1.

Thracidentula perulæ sp. nov.

(Pl. 1, fig. 10.)

Description: Shell oblong, equilateral, inequivalve, thin, semi-transparent, posterior side truncated and widely gaping, anterior side rounded, a slight furrow runs obliquely from umbo to posterior ventral margin on both valves; lunule long and narrow; resilifer long and widening towards posterior end, attached for full length; interior connecting lithodesma shaped like an arrow head when viewed from above, in situ pointing to anterior end.

Sculpture consists of wavy radiating irregularly spaced lines of fine granules, covered by a fine pale salmon-pink periostracum. Colour of shell off-white, lunule bright salmon-pink; interior of shell nacreous and off-white; pallial sinus wide and shallow.

Dimensions: Holotype, length 36 mm., height 26 mm., section of conjoined valves 15 mm.

Type Locality: In 45 fathoms east of Broken Bay, N.S.W.

Types: Holotype presented to Australian Museum, Sydney, where it is registered No. C. 63340, with one paratype; one paratype in author's collection, with another from 50 fathoms east of Newcastle, and a further paratype from type locality presented to National Museum of Victoria, Melbourne.

FAMILY POROMYIDAE

ECTORISMA Tate 1892, Trans. Roy. Soc. South Aust., 15, p. 127, type species by original designation *granulata* Tate.

granulata Tate 1892, Trans. Roy. Soc. South Aust., 15, p. 127, pl. 1, figs. 3, 3a.

One live specimen in 100 fathoms east of Stanwell Park.

FAMILY CUSPIDARIIDAE

CUSPIDARIA Nardo 1840, Revue Zool. Soc. Cuv. 1840, p. 30, type species by original designation *cuspidata* Olivi.

latesulcata Tenison-Woods 1878, Proc. Linn. Soc. N.S.W., 2, p. 123.

One live specimen off Cape Moreton; three live specimens in 45 fathoms east of Broken Bay; one live specimen in 37-40 fathoms east of Barrenjoey Light; two single valves in 45 fathoms east of Botany Bay.

exarata Verco 1908, Trans. Roy. Soc. South Aust., 32, p. 199, pl. 12, figs. 6, 7.

One dead specimen in 142 fathoms east of Tuggerah Lakes; one dead specimen in 45 fathoms off Broken Bay; five live specimens in 70 fathoms east of Stanwell Park.

SUBCLASS TELEODESMACEA

FAMILY EUCRASSATELLIDAE

EUCRASSATELLA Iredale 1924, Proc. Linn. Soc. N.S.W., 49, pp. 181, 202, type species by original designation *kingicola* Lamarck.

kingicola Lamarck 1805, Ann. Mus. Hist. Nat. Paris, 6, p. 408.

One live specimen in 40 fathoms east of Twofold Bay.

FAMILY CARDITIDAE

CARDITA Bruguiere 1792, Tabl. Ency. Meth. Vers., 2, p. 401, type species by subsequent designation (Fleming 1818, Conchology (Encycl. Britt., Suppl. 3) p. 305) *variegata* Bruguiere.

amabilis Deshayes 1854, Proc. Zool. Soc. Lond., 1852, p. 102, pl. 17, figs. 8, 9.

One single valve in 65 fathoms east of Broken Bay; one single valve in 50 fathoms east of Botany Bay.

VIMENTUM Iredale 1925, Rec. Aust. Mus., 14, pp. 248, 254, type species by original designation *dilectum* Smith.

cavaticum Hedley 1902, Mem. Aust. Mus., 4, p. 318, fig. 58.

One single valve in 50 fathoms east of Broken Bay; two live specimens and four single valves in 50 fathoms east of Botany Bay.

BATHYCARDITA Iredale 1924, Proc. Linn. Soc. N.S.W., 49, pp. 182, 205, type species by original designation *raouli* Angas.

raouli Angas 1872, Proc. Zool. Soc. Lond., 1872, p. 613, pl. 42, f. 12.

A fair number of live specimens obtained along most parts of the New South Wales coast from Port Stephens to the Victorian border, in depths from 50 to 90 fathoms.

FAMILY DOSINIIDAE

MERIDOSINIA Iredale 1930, Rec. Aust. Mus., 17, p. 394, type species by original designation *nedigna* Iredale.

nedigna Iredale 1930, Rec. Aust. Mus., 17, p. 394, pl. 64, figs. 4, 5.

One single valve in 45 fathoms east of Botany Bay.

FAMILY LIOCONCHIDAE

NOTOCALLISTA Iredale 1924, Proc. Linn. Soc. N.S.W., 49, pp. 182, 210, type species by original designation *kingii* Gray.

kingii Gray 1826, Survey Coasts Austral. (King), 2, p. 476.

One live specimen in 76-80 fathoms east of Lake Macquarie; one live specimen in 37-40 fathoms east of Barrenjoey Light; six live specimens in 65 fathoms east of Stanwell Park; one live specimen in 45 fathoms east of Port Kembla.

FAMILY SOLECURTIDAE

SOLECURTUS Blainville 1824, Dict. Sci. Nat. (Levr.), 32, p. 351, type species by subsequent designation (Deshayes 1829, Dict. Class. d'Hist. Nat., 15, p. 482) *strigilatus* Linne.

australis Deshayes 1862, Proc. Zool. Soc. Lond., 1861, p. 424.

One live specimen in 75-85 fathoms N.E. of Newcastle.

FAMILY MACTRIDAE

NANNOMACTRA Iredale 1930, Rec. Aust. Mus., 17, p. 400, type species by original designation *jacksonensis* Smith.

pusilla A. Adams 1855, Proc. Zool. Soc. Lond., p. 226.

One live juvenile specimen in 50 fathoms east of Port Kembla.

CLASS GASTROPODA
SUBCLASS PROSOBRANCHIA
FAMILY TROCHIDAE

ARCHIMINOLIA Iredale 1929, Rec. Aust. Mus., 17, p. 170, type species by original designation *oleacea* Hedley & Petterd.

oleacea Hedley & Petterd 1906, Rec. Aust. Mus., 6, p. 215, pl. 37, f. 1.

One large dead specimen in 140 fathoms off Norah Head. An extremely rare species.

CLANCULUS Montfort 1810, Conch. Syst., 2, p. 190, type species by original designation *pharaonius* Linne.

albugo Watson 1885, Chall. Zool., 15, p. 75, pl. 6, f. 8.

One dead specimen in 75 fathoms east of Botany Bay.

ASTELE Swainson 1854, Proc. Roy. Soc. Tas., 3, p. 36, types species by monotypy *subcarinatum* Swainson.

subcarinatum Swainson 1854, Proc. Roy. Soc. Tas., 3, p. 36, pl. 6, figs. 1, 2.

Two dead specimens in 30 fathoms east of Lakes Entrance; one dead specimen in 45 fathoms east of Bermagui.

*Astele bularra** sp. nov.

(Pl. 2, fig. 5.)

Remarks: This species is another very fine addition to the attractive shells comprising the subfamily Calliostomatinae, and the fact that this shell has also come to hand since from fairly shallow water in Moreton Bay, also off Caloundra and Broken Bay, is further indication of the number of new species which probably still await discovery on the eastern continental shelf, if and when an organised dredging expedition can be undertaken.

Description: Shell of medium size, regularly trochoid, umbilicus partially callused over; protoconch very small, smooth, medium brown in colour, of one whorl only, set at an oblique angle, and merging gradually into sculpture of main whorls, which number nine; sculpture cancellate in earlier whorls, the longitudinal striations becoming less pronounced until sculpture resolves itself into revolving rows of uniform beading, a double row being present on the somewhat prominent shoulders above the sutures, and four rows between each shoulder and the suture above; midway between these rows is a less prominent row of beading, with smaller ones on either side, the whole crossed by faint oblique growth lines; base slightly convex with nine prominent rows of beading and smaller rows interposed as on the upper side of whorls, and still smaller lines between these as before, the whole crossed by obliquely radiating growth striae; colour of shell pale cream shading to light luminous bronze on later whorls, on which the more prominent rows of beading stand out as white lines; last row of beading above suture has brown spots at regular intervals; base white.

Columella curved outwards and approximately parallel with outside edge of shell, aperture thus being roughly the shape of a parallelogram:

*An aboriginal word meaning "several waters".

the small umbilicus half covered by a reflected nacreous callus formed over inner lip, whilst a well defined funicle ascends spirally from base of callus into umbilicus.

Dimensions: Holotype, height 28 mm., major diameter 27 mm., minor diameter 24 mm.

Type Locality: Trawled off Cape Moreton, Q., exact depth unknown.

Types: Holotype registered at Australian Museum, Sydney, No. C. 63341, with one paratype; two paratypes registered at National Museum of Victoria, Melbourne, No. F. 21139; one dead specimen in author's collection from 50 fathoms east of Broken Bay, with three dead specimens from 40 fathoms east of Caloundra, Q.

SALSIPOTENS Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 230, type species by original designation *armillatus* Wood.

speciosa A. Adams 1855, Proc. Zool. Soc. Lond., p. 38.

Two live specimens in 50 fathoms east of Broken Bay.

FAMILY TURBINIDAE

BELLASTRAEA Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 232, type species by original designation *kesteveni* Iredale.

kesteveni Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 232.

Two live specimens in 45 fathoms east of Botany Bay.

FAMILY LIOTIIDAE

AUSTROLIOTIA Cotton 1948, Trans. Roy. Soc. South Aust., 7 (1), p. 30, type species by original designation *botanica* Hedley.

scalaris Hedley 1903, Mem. Aust. Mus., 4, p. 336.

Hedley's description and Iredale's illustration published in 1936, (Rec. Aust. Mus., 19 (5), p. 287, pl. 21, f. 15), are based on the only two specimens then recorded, both with immature lips. A single mature specimen now recorded from 75 fathoms east of Broken Bay agrees in all respects with the original description and illustration, the mature mouth being perfectly circular and entire, the margin broadened by a thick varix.

FAMILY RISSOINIDAE

STIVA Hedley 1904, Proc. Linn. Soc. N.S.W., 29, p. 192, type species by original designation *ferruginea* Hedley.

ferruginea Hedley 1904, Proc. Linn. Soc. N.S.W., 29, p. 192, pl. 9, f. 23-25.

Six dead specimens from 50 fathoms east of Botany Bay; one in 45 fathoms east of Broken Bay.

FAMILY CALYPTRAEIDAE

SIGAPATELLA Lesson 1830, Zool. Coquille, 2, p. 389, type species by subsequent designation (Dall 1909, U.S. Geol. Survey Prof. pap., 591, p. 82) *novaezelandiae* Lesson.

calyptraeiformis Lamarck 1822, Hist. Anim. s. Vert., 7, p. 12.

One dead specimen in 37-40 fathoms east of Barrenjoey Light; one alive in 45 fathoms east of Botany Bay; one dead and two live

specimens in 45 fathoms east of Port Kembla attached to dead shells.

CAPULUS Montfort 1810, Conch. Syst., 2, p. 54, type species by original designation *hungaricus* Linne.

devotus Hedley 1904, Proc. Linn. Soc. N.S.W., 29, p. 190, pl. 8, f. 15-16.

Seven dead specimens in unknown depth south of Cape Moreton; four live specimens in 156-160 fathoms east of Newcastle; three live specimens in 100-126 fathoms 40 miles E.N.E. of Sydney; a number of live specimens taken in 70 fathoms and over, east of Broken Bay, mostly attached to inner lip of dead *Cymatona kampylum* Watson; two live specimens in 85 fathoms east of Stanwell Park.

Capulus sycophanta sp. nov.

(Pl. 2, figs. 1a, b.)

Remarks: In common with a number of shells in the past, this appears to be yet another instance of one which has been known to local fishermen and others for many years but apparently never forwarded to a Museum for identification. A study of the animal has not yet been carried out, but it is apparently parasitic in habit, as in addition to adhering to the shell of the common *Amusium balloti* Bernardi, in every adherent specimen received a hole has been bored into the host shell, varying in size from about $\frac{1}{8}$ " to $\frac{3}{16}$ ". The shell invariably adheres with the beak pointing approximately in the direction of the umbonal area of the host, the hole drilled close to the left hand margin of its own shell. This new species is strongly reminiscent of *Capulus dilatatus* A. Adams, from Japan.

Description: Shell large for the family, sub-circular in outline, fairly well elevated; nucleus smooth and well recurved, sometimes straight but can be inclined to right or left, usually level with edge of shell or projecting a little beyond it; sculpture of numerous fine radiating striae, commencing at base of beak, and extending to margin in every direction, in some cases commencing on beak itself, and crossed by irregular growth lines.

Colouration light fawn background with light pinkish-brown radiating rays, usually a pink tinge on beak; interior quite smooth and polished, sometimes pure white with pink edge, often flushed with carmine; a light fawn periostracum present over whole outer surface.

Dimensions: Holotype, length 37 mm., breadth 33 mm., height 14 mm.

Type Locality: Trawled in 25 fathoms in Keppel Bay.

Types: Holotype presented to Australian Museum, Sydney, where it is registered No. C. 63342, with several paratypes; several paratypes in author's collection, others presented to National Museum of Victoria.

FAMILY CERITHIIDAE

ATAXOCERITHIUM Tate 1894, Jour. Roy. Soc. N.S.W., 32, p. 179, type species by original designation *serotinum* A. Adams 1855.

applenum Iredale 1936, Rec. Aust. Mus., 19 (5), p. 291, pl. 21, f. 19.

Two live specimens in 50 fathoms east of Lakes Entrance.

FAMILY TURRITELLIDAE

GAZAMEDA Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 247, type species by original designation *gunnii* Reeve.

gunnii Reeve 1849, Conch. Icon., 5, pl. 9, f. 45.

Found in fair numbers in 40 to 100 fathoms from Broken Bay to Port Kembla; two in 35 fathoms S.E. of Lakes Entrance.

tasmanica Reeve 1849, Conch. Icon., 5, pl. 9, f. 42.

Two dead specimens east of Broken Bay; seven dead specimens in 40 to 70 fathoms east of Port Kembla; three dead specimens east of Bermagui; three dead specimens in 35 fathoms S.E. of Lakes Entrance.

decoramen Iredale 1936, Rec. Aust. Mus., 19, (5), p. 292, pl. 21, f. 20.

Three dead specimens east of Botany Bay.

PLATYCOLPUS Donald 1900, Proc. Mal. Soc. Lond., 4, p. 54, type species by original designation *quadratus* Donald.

quadratus Donald 1900, Proc. Mal. Soc. Lond., 4, p. 54, pl. 5, f. 8, 8b.

Five dead specimens in 40 fathoms east of Twofold Bay.

FAMILY ZEMIRIDAE

ZEMIRA H. & A. Adams 1853, Gen. Rec. Moll., p. 110, type species by monotypy *australis* Sowerby.

australis Sowerby 1841, Conch. Illustr., p. 20, List 8, f. 5.

One live specimen in 73-80 fathoms east of Lake Macquarie; one dead specimen in 75 fathoms east of Stanwell Park; one live specimen S.E. of Lakes Entrance.

FAMILY XENOPHORIDAE

XENOPHORA Fischer 1807, Mus. Demidoff., 3, p. 213, type species by monotypy *laevigata* G. Fischer (= *conchyliophora* Born).

peroniana Iredale 1929, Rec. Aust. Mus., 17 (4), p. 172.

Found in fair quantities from Port Stephens to Bass Strait in varying depths up to 100 fathoms, and one of the commonest shells trawled off the N.S.W. coast during the survey.

FAMILY STROMBIDAE

LAMBIS Röding 1798, Mus. Bolten, 2, p. 61, type species by tautonymy *lambis* Linne.

lambis Linne 1758, Syst. Nat., Ed. 10, p. 743.

One juvenile specimen east of Broken Bay, depth unknown.

FAMILY EPITONIIDAE (SCALIDAE)

DANNEVIGENA Iredale 1936, Rec. Aust. Mus., 19 (5), p. 303, type species by original designation *martyr* Iredale.

martyr Iredale 1936, Rec. Aust. Mus., 19 (5), p. 303, pl. 22, f. 25.

Three dead specimens in 70 fathoms east of Stanwell Park.

FAMILY CYMATHIDAE

CHARONIA Gistel & Bromme 1847, Handb. Naturg., p. 559, type species by monotypy *tritonis* Linne.

eucليا instructa Iredale 1929, Rec. Aust. Mus., 17 (4), p. 172, pl. 41, f. 5.

Four immature live specimens in 50 fathoms east of Broken Bay.

CABESTANIMORPHA Iredale 1936, Rec. Aust. Mus., 19, p. 307, type species by original designation *exarata* Reeve (= *tabulata* Menke). *tabulata* Menke 1843, Spec. Moll. Nov. Holl., p. 25.

Trawled in fair numbers and in varying depths from Newcastle to Port Kembla.

zimara Iredale 1929, Aust. Zool., 5 (4), p. 345, pl. 38, f. 11.

Two dead specimens east of Broken Bay; one dead specimen east of Bermagui.

MONOPLEX Perry 1811, Conch., pl. 3, type species by subsequent designation (Clench & Turner 1957, Johnsonia, 3, p. 227) *australasiae* Perry.

australasiae Perry 1811, Conch., pl. 4, f. 2, 4.

One dead specimen N.N.E. of Cape Byron.

CYMATONA Iredale 1929, Rec. Aust. Mus., 17, p. 177, type species by original designation *kampyla* Watson.

kampyla Watson 1885, Jour. Linn. Soc. Zool., 16, p. 594.

Found in fair numbers, all dead specimens, in depths of 70 fathoms and over from Newcastle to Stanwell Park, a number having *Capulus devotus* Hedley attached, always to inner lip.

PHANOZESTA Iredale 1936, Rec. Aust. Mus., 19 (5), p. 309, type species by original designation *remensa* Iredale.

remensa Iredale 1936, Rec. Aust. Mus., 19 (5), p. 309, pl. 23, f. 4.

Found in fair numbers in 70 fathoms and over off Broken Bay and Botany Bay, those from former locality all being taken alive, those from latter locality all dead specimens.

FUSITRITON Cossman 1903, Essai Paleo. comp., 5, p. 87, type species by original designation *cancellatus* Lamarck.

retiolus Hedley 1914, Biol. Res. Endeav., 2, p. 73, pl. 11, f. 5.

Two dead specimens in 75 fathoms east of Broken Bay; one in 120-125 fathoms east of Manly.

AUSTROSASSIA Finlay 1931, Trans. New Zeal. Inst., 62, p. 7, type species by original designation *parkinsonia* Perry.

parkinsonia basilica Iredale 1924, Proc. Linn. Soc. N.S.W., 49 (3), p. 253, pl. 35, f. 4.

Four dead specimens east of Botany Bay; one east of Port Kembla.

MAYENA Iredale 1917, Proc. Malac. Soc., 12, p. 324, type species by original designation *australasia* Perry.

australasia Perry 1811, Conch., pl. 4, figs. 2, 4.

One dead specimen east of Bermagui.

australasia benthicola Iredale 1929, Rec. Aust. Mus., 17 (4), p. 174, pl. 41, f. 4.

Trawled in fair numbers east of Broken Bay, Botany Bay and Port Kembla.

DISTORSIO Röding 1798, Mus. Bolten, 2, p. 133, type species by subsequent designation (Pilsbry 1922, Proc. Acad. Nat. Sci. Philad., 73, p. 357) *anus* Linne.

francesae Iredale 1931, Rec. Aust. Mus., 18 (4), p. 213, pl. 23, f. 2.

One dead specimen off Cape Moreton; one dead specimen east of Broken Bay; one dead specimen east of Port Kembla.

BURSA Röding 1798, Mus. Bolten, 2, p. 128, type species by subsequent designation (Jousseaume 1881, Bull. Soc. Zool. France, 6, p. 175) *bufonia* Gmelin.

Bursa latitudo sp. nov.

(Pl. 2, fig. 2.)

Remarks: In common with many other shells from fairly deep water, this species is thinner and lighter in weight than others of the family of comparable size, and the possibility that it only inhabits the waters beyond the edge of the continental shelf could account for its not being previously discovered by trawling.

Description: Shell of fair size, light in weight, less nodular than most of the genus; protoconch of $3\frac{1}{2}$ whorls, first of which is planate, smooth, and terminates abruptly before commencement of main whorls, which number six; varices ten, sculpture consisting of very fine numerous revolving striae, with a row of fairly prominent nodules in centre of each whorl, a second row visible in places at the base of each whorl, at times covered by sutures, whilst a third rather obsolete row shows towards anterior end of body whorl; aperture sub-circular, outer lip thickened and dentate within, a fairly heavy callus formed over inner lip and finely wrinkled; canal short, open and recurved; a well defined posterior sinus present with a fairly prominent ridge adjoining on inner lip; colour light fawn with small patches of brown on nodules and varices; whole of aperture and interior pure white.

Dimensions: Holotype, length 95 mm., breadth 55 mm., length of aperture, excluding posterior sinus, 26 mm.

Type Locality: Trawled in 125 fathoms off Moreton Is., Q.

Type: Holotype registered at National Museum of Victoria, Melbourne, No. F. 21111; one small and badly damaged paratype registered at the Australian Museum, No. C. 63353.

FAMILY CASSIDIDAE

XENOGALEA Iredale 1927, Rec. Aust. Mus., 15 (5), p. 339, type species by original designation *pyrum* Lamarck.

insperata Iredale 1927, Rec. Aust. Mus., 15 (5), p. 349, pl. 31, f. 8.

One dead specimen in 50 fathoms off Broken Bay; one dead specimen in 45 fathoms off Stanwell Park.

thomsoni Brazier 1875, Proc. Linn. Soc. N.S.W., 1, p. 8.

One live specimen in 110-115 fathoms N.E. of Newcastle; one live specimen in 95 fathoms east of Tuggerah; four live specimens in 60 fathoms east of Broken Bay; five live specimens in 60 fathoms east of Botany Bay; two live specimens in 50 fathoms east of Stanwell Park.

pyrum Lamarck 1822, Hist. Anim. s. Vert., 7, p. 226.

Two live specimens in 60 fathoms east of Broken Bay; one live specimen in 60 fathoms east of Botany Bay.

NANNOCASSIS Iredale 1927, Rec. Aust. Mus., 15 (5), p. 328, type species by original designation *nana* Tenison-Woods.

nana Tenison-Woods 1879, Proc. Linn. Soc. N.S.W., 4, p. 108.

Three dead specimens off Cape Moreton, three south of Cape Moreton, one off Moreton Is., depths unknown.

SEMICASSIS Morch 1852, Cat. Conch. Yoldi., 1, p. 112, type species by subsequent designation (Harris 1897, Cat. Tert. Moll. Brit. Mus., 1, p. 198) *japonica* Reeve.

diuturna Iredale 1927, Rec. Aust. Mus., 15 (5), p. 335, pl. 32, f. 9

Two dead specimens off Cape Moreton, unknown depth.

Pulchroniscia delecta gen. et sp. nov.

(Pl. 1, figs. 9a, b.)

Remarks: A very fine new species was trawled in 75 fathoms east of Botany Bay, which although not an actual Cassid form is placed in this family for the present as being the closest available. Related to *Oniscidia cancellata* Sowerby from China, which was recently trawled in Queensland.

Generic characteristics are the pyriform shape, acuminate spire, heavy reflected and denticulate outer lip, and strong axial plications.

Description: Shell pyriform in shape, spire fairly acuminate, main whorls five; protoconch of three whorls, exerted, smooth and translucent; aperture produced posteriorly, at maturity level with shoulder of preceding whorl and 72% of total length of shell; outer lip thickened and recurved, finely denticulate within; a heavy callus over inner lip extending onto main body whorl, finely denticulate at posterior end, merging into an irregular row of small nodules at anterior end; sculpture of strong axial plications, slightly spinose on shoulders and weakening towards anterior end, there being sixteen on main body whorl; fairly fine growth striae in interstices and over-riding the plications, the whole crossed by

fairly strong concentric ridges; colour a blending of pale cream to fawn, giving a slightly banded appearance, four light brown patches on recurved edge of outer lip, and a narrow brown blotch in centre of columella.

Dimensions: Holotype, length 40 mm., breadth 26 mm., length of aperture 29 mm.

Type Locality: Dredged in 75 fathoms east of Botany Bay, N.S.W.

Type: The holotype, the only known specimen, presented to Australian Museum, Sydney, where it is registered No. C. 63343.

FAMILY TONNIDAE

TCNNA Brunnich 1772, Zool. Fund., p. 248, type species by monotypy *galea* Linne.

tetracotula Hedley 1919, Rec. Aust. Mus., 12, p. 332, pl. 42-43, f. 4-5.

Two dead specimens off Cape Moreton, depth unknown.

EUDOLIUM Dall 1889, Bull. Mus. Comp. Zool. (Harvard), 18, pp. 20, 232, type species by original designation *croceanum* Monterosato.

pyriforme Sowerby 1914, Ann. Mag. Nat. Hist., (8), 14, p. 37, pl. 2, f. 14.

One dead specimen in 75 fathoms east of Broken Bay.

FAMILY FICIDAE

FICUS Röding 1798, Mus. Bolten, 2, p. 148, type species by tautonymy *ficus* Gmelin.

filosus Sowerby 1893, Conchologist, 2, p. 74.

Two live specimens in 75 fathoms east of Broken Bay.

Remarks: Although the type locality for this species is given as Hong Kong, and to the author's knowledge it has not been recorded previously from the Australian coast, the two specimens now recorded agree well with the original description. Moreover the general outline and sculpture appear to be identical with the excellent photographs by Kuroda and Habe in Illustrated Catalogue of Japanese Shells, No. 19, 1952, p. 134. There appears no reason therefore to re-name the shells now recorded merely because of the distance from the type locality.

This is not the common species usually called *communis* Röding from the east coast of Australia, which in any case is probably *Ficus ficoides* Lamarck, and of which *Ficus margaretae* Iredale (Rec. Aust. Mus., 18 (4), 1931, p. 216, pl. 23, f. 4) must be regarded as a synonym.

FAMILY NATICIDAE

NOTOCOCHLIS Powell 1933, Trans. New Zeal. Inst., 63, p. 166, type species by original designation *migratoria* Powell.

luculenta Iredale 1929, Rec. Aust. Mus., 17, p. 179, pl. 40, f. 10.

Two dead specimens in 70 fathoms east of Broken Bay; three dead specimens from 70 fathoms east of Stanwell Park; one dead specimen in 50 fathoms east of Port Kembla.

POLINICES Montfort 1810, Conch. Syst., 2, p. 222, type species by original designation *albus* Montfort = *mamilla* Linne.

Polinices putealis sp. nov.

(Pl. 2, fig. 6.)

Remarks: It appears remarkable that the shell here described should have remained undiscovered for so long, being in a locality which has been trawled for so many years, and ten specimens were received from the "Challenge" on one trip to the area. It cannot be confused with any other species, being pure white and shining, with the umbilicus extending right through to the spire of shell.

Description: Shell solid, helicoid, very glossy; pure white, carrying traces of a light fawn and very thin periostracum; whorls five, slowly increasing, the last half whorl descending and expanding rapidly; spire small and acute; aperture oblique, semi-lunate and nearly half total breadth; callus narrow with very small lobe extending slightly across the wide umbilical opening, which narrows gradually as it extends through to spire of shell.

Dimensions: Holotype, length 27 mm., breadth 22 mm., length of aperture 17 mm.

Type Locality: Trawled in 50-58 fathoms east of Botany Bay.

Types: Holotype presented to Australian Museum, Sydney, where it is registered No. C. 63344 with two paratypes; three paratypes presented to National Museum of Victoria, Melbourne, and four paratypes in author's collection.

FRIGINATICA Hedley 1915, Aust., Antarc. Exped., 1911-14, Sci. Rep., 4, p. 57, type species by original designation *beddomei* Johnston.

beddomei Johnston 1885, Proc. Roy. Soc. Tas., 1884, p. 222 (— *effossa*

Watson 1886, Rep. Sci. Res. Challenger Zool., 15, p. 439, pl. 28, f. 3).

One dead specimen in 45 fathoms east of Botany Bay.

PROPESINUM Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 256, type species by monotypy *umbilicatum* Quoy & Gaimard.

umbilicatum minusculum Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 256.

(Pl. 2, fig. 3.) Not previously figured.

One live specimen in 45 fathoms east of Botany Bay, Australian Museum, No. C. 63354.

FAMILY LAMELLARIIDAE

MYSTICONCHA Allan 1936, Rec. Aust. Mus., 19, p. 393, type species by original designation *wilsoni* Smith.

wilsoni Smith 1886, Ann. Mag. Nat. Hist., (5) 18, p. 270 and figure.

One live specimen in 35 fathoms S.E. of Newcastle.

FAMILY TRIVIIDAE

ELLATRIVIA Iredale 1931, Rec. Aust. Mus., 18, p. 221, type species by original designation *merces* Iredale.

merces addenda Iredale 1931, Rec. Aust. Mus., 18, p. 221. Not figured.

One live specimen in 37-40 fathoms east of Barrenjoey Light; two live specimens in 50 fathoms S.E. of Lakes Entrance.

FAMILY UMBILIIDAE

UMBILIA Jousseaume 1884, Le Naturaliste, 6th year, p. 414, type species by monotypy *umbilicata* Sowerby (= *hesitata* Iredale).

hesitata Iredale 1916, Proc. Malac. Soc., 12, p. 93.

Found in large numbers alive in depths from 25 to 100 fathoms from vicinity of Port Stephens to Bass Strait. The belief that mature shells decrease in size as the northern limit of their range is reached (subspecies *beddomei* Schilder 1930) cannot be sustained, as fully mature shells ranging in length from 101 mm. down to 51 mm. were obtained throughout the full length of this range.

FAMILY CYPRAEIIDAE

SOLVADUSTA Iredale 1935, Aust. Zool., 8, p. 217, type species by original designation *vaticina* Iredale.

subviridis Reeve 1835, Proc. Zool. Soc. Lond., p. 68, and Conch. Icon., 3, 1845, *Cypraea*, pl. 12, f. 48.

One live specimen off Moreton Is.

VOLVA Röding 1798, Mus. Bolten, 2, p. 21, type species by tautonymy *volva* Linne.

volva Linne 1758, Syst. Nat. Ed., 10, p. 725.

One live specimen N.N.E. of Cape Byron.

FAMILY VOLUTIDAE

CYMBIOLISTA Iredale 1929, Rec. Aust. Mus., 17, p. 181, type species by original designation *hunteri* Iredale.

hunteri Iredale 1931, Rec. Aust. Mus., 18, p. 223.

One dead specimen off Cape Moreton; one dead specimen N.N.E. of Cape Byron.

CYMBIOLACCA Iredale 1929, Rec. Aust. Mus., 17, p. 181, type species by original designation *complexa* Iredale.

complexa Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 258.

Two dead specimens N.N.E. of Cape Byron, N.S.W.

pulchra pulchra Sowerby 1825, Cat. Tankerville, App. p. 28, pl. 4, f. 2.

Three dead specimens east of Cape Moreton, Q., and four dead specimens south of same locality.

ERICUSA H. & A. Adams 1858, Gen. Rec. Moll., 2, p. 619, type species by subsequent designation (Cotton & Godfrey 1932, South Aust. Nat., 13, p. 49) *fulgetrum* Sowerby.

papillosa kenyoniana Brazier 1898, Proc. Linn. Soc. N.S.W., 22, p. 779.

One dead immature specimen in 90-100 fathoms east of Tuggerah Lakes.

sericata Thornley 1951, Proc. Roy. Zool. Soc. N.S.W., 1949-50, p. 53, figs. in text.

One large dead specimen in 50 fathoms east of Laurieton (in collection of Mr. Evans Paddon); one dead specimen off Cape Moreton; one off Moreton Is.

MESERICUSA Iredale 1929, Rec. Aust. Mus., 17, p. 181, type species by original designation *sowerbyi perspecta* Iredale.

sowerbyi perspecta Iredale 1929, Rec. Aust. Mus., 17, p. 181, pl. 41, f. 9.

One small dead specimen, deeply coloured, in 90-100 fathoms east of Tuggerah Lakes; two similar small dead specimens in 50 fathoms east of Broken Bay; one large dead specimen east of Bermagui.

NANNAMORIA Iredale 1929, Rec. Aust. Mus., 17, p. 181, type species by original designation *amica* Iredale.

amica Iredale 1929, Rec. Aust. Mus., 17, p. 181, pl. 40, f. 4.

Two dead specimens in 70 fathoms east of Broken Bay, and it is understood that a third specimen was obtained from the same area. Owing to the worn nature of the type specimen of this rare shell, opportunity is now taken to describe the colour as being a pale fawn background, with undulating longitudinal chestnut lines. A row of chestnut blotches encircles the body whorl, with chestnut splashes below the sutures.

parabola Garrard 1960, Jour. Mal. Soc. Aust., 4, p. 3, pl. 1, f. 1a, b.

One dead mature specimen and two immature specimens from 125 fathoms off Moreton Is., Q.

AMORENA Iredale 1929, Rec. Aust. Mus., 17, p. 180, type species by original designation *undulata* Lamarck.

undulata Lamarck 1804, Ann. Mus. Hist. Nat. Paris, 5, p. 157, pl. 12, f. 1.

Found in fair quantities from Newcastle to Broken Bay area, mostly small and immature. It would seem from experience that the larger live specimens probably burrow too deeply to be brought up in the nets, especially during daylight hours; one dead specimen also from N.N.E. of Cape Byron.

RELEGAMORIA Iredale 1936, Rec. Aust. Mus., 19, p. 314, type species by original designation *molleri* Iredale.

molleri Iredale 1936, Rec. Aust. Mus., 19, p. 314, pl. 23, f. 10.

It is known that at least 30 live specimens were trawled between Newcastle and Broken Bay, in depths from 90 to 120 fathoms, mainly just over the edge of the continental shelf; one also N.N.E. of Cape Byron, N.S.W. Study of these shells reveals that the white glaze on the holotype as described by Iredale is not typical, all shells being a uniform light brown in colour and highly polished, whilst the peculiar ridge on the inside of the outer lip is present in all mature specimens and is not an aberration.

ZEBRAMORIA Iredale 1929, Rec. Aust. Mus., 17, p. 180, type species by original designation *zebra* Leach.

zebra Leach 1814, Zool. Miscell., 1, p. 31, pl. 12, f. 1.

Two live specimens off Cape Moreton.

TERNIVOLUTA Martens 1897, Arch. fur Naturg., 63, p. 177, type species by original designation *studerii* Martens.

studerii Martens 1897, Arch. fur Naturg., 63, p. 177-8, pl. 17, f. 2.

At least 60 specimens are known to have been trawled in depths down to 125 fathoms off Moreton Is., many being alive.

FAMILY MICROVOLUTIDAE

MICROVOLUTA Angas 1877, Proc. Zool. Soc. Lond., 1877, p. 34, type species by monotypy *australis* Angas.

royana Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 269, pl. 35, f. 13.

One dead specimen in 50 fathoms east of Botany Bay.

FAMILY MITRIDAE

VICIMITRA Iredale 1929, Aust. Zool., 5, p. 343, type species by monotypy *prospora* Iredale.

prospora Iredale 1929, Aust. Zool., 5, p. 343, pl. 38, f. 17.

One dead specimen off Cape Moreton; one dead specimen in 50 fathoms east of Broken Bay; two dead specimens in 45 fathoms east of Botany Bay.

AUSTROMITRA Finlay 1927, Trans. New Zeal. Inst., 57, p. 410, type species by original designation *rubiginosa* Hutton.

strangei Angas 1867, Proc. Zool. Soc. Lond., 1867, p. 110, pl. 13, f. 4.

One dead specimen east of Botany Bay.

FAMILY HARPIDAE

PALAMHARPA Iredale 1931, Rec. Aust. Mus., 18, p. 230, type species by original designation *exquisita* Iredale.

exquisita Iredale 1931, Rec. Aust. Mus., 18, p. 230, pl. 22, f. 8.

One dead specimen off Botany Bay; several fine dead specimens off Twofold Bay-Gabo Is. area; one live specimen in 33 fathoms off Deal Is., Bass Strait.

FAMILY OLIVIDAE

BELLOLIVA Peile 1922, Proc. Malac. Soc., 15, p. 18, type species by original designation *brazieri* Angas.

leucozona brazieri Angas 1877, Proc. Zool. Soc. Lond., 1877, p. 172. pl. 26, f. 6.

Two live specimens in 45 fathoms east of Botany Bay.

CUPIDOLIVA Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 259, type species by original designation *nympha* A. Adams & Angas.

nympha A. Adams & Angas 1864, Proc. Zool. Soc. Lond., 1863, p. 422.

Three dead specimens off Botany Bay.

FAMILY ANCILLIDAE

ANCILLISTA Iredale 1936, Rec. Aust. Mus., 19, p. 314, type species by original designation *velesiana* Iredale.

velesiana Iredale 1936, Rec. Aust. Mus., 19, p. 314, pl. 23, f. 9.

One live specimen off Cape Moreton; one live specimen in 76-80 fathoms off Lake Macquarie.

ALOCOSPIRA Cossman 1899, Essais Paleo. comp. livr., 3, p. 92, type species by original designation *papillata* Tate.

oblonga Sowerby 1830, Spec. Conch., *Ancillaria*, p. 7, pl. 13, f. 38-9.

Five dead specimens off Port Kembla.

marginata tasmanica Tenison-Woods 1878, Proc. Roy. Soc. Tas., 1877, p. 30.

Two dead specimens in 45 fathoms east of Twofold Bay.

fusiformis gaza Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 261, pl. 36, f. 9.

Two dead specimens in 50 fathoms east of Port Kembla; one dead specimen east of Bermagui.

FAMILY MARGINELLIDAE

OVAGINELLA Laseron 1957, Aust. Jour. Mar. Freshwater Res., p. 280, type species by original designation *ovulum* Sowerby.

ovulum Sowerby 1846, Thes. Conch., 1, p. 401, pl. 78, f. 188.

Three dead specimens off Botany Bay.

whani Pritchard & Gatliff 1900, Proc. Roy. Soc. Vic., 13, (n.s.), p. 137, pl. 21, f. 5-6.

One dead specimen off Botany Bay.

SINUGINELLA Laseron 1957, Aust. Jour. Mar. Freshwater Res., 8, p. 282, type species by original designation *inconspicua* Sowerby.

punicea Laseron 1948, Rec. Aust., Mus., 22, p. 38, pl. 5, f. 7.

Three dead specimens off Botany Bay.

biniivitta Laseron 1948, Rec. Aust. Mus., 22, p. 39, pl. 5, f. 11.

Three dead specimens off Botany Bay.

KOGOMEA Habe 1951, Illus. Cat. Jap. Shells, (ed. T. Kuroda), p. 103, f. 11, type species by original designation *novem-provincialis* Yokoyama.

stilla Hedley 1903, Mem. Aust. Mus., 4, p. 367, f. 90.

Three dead specimens in 50 fathoms off Botany Bay.

PROTOGINELLA Laceron 1957, Aust. Jour. Mar. Freshwater Res., 8, p. 285, type species by original designation *lavigata* Brazier.

geminata Hedley 1912, Rec. Aust. Mus., 8, p. 145, pl. 42, f. 28.

One live specimen off Botany Bay.

FAMILY CANCELLARIIDAE

SYDAPHERA Iredale 1929, Aust. Zool., 5, p. 341, type species by original designation *renovata* Iredale.

anxifer Iredale 1925, Rec. Aust. Mus., 14, p. 264, pl. 43, f. 24.

One dead specimen in 45 fathoms east of Port Kembla.

FAMILY ARCHITECTONICIDAE

ARCHITECTONICA Röding 1798, Mus. Bolten, 2, p. 78, type species by subsequent designation (Gray 1847, Proc. Zool. Soc. Lond., p. 151) *perspectiva* Linne.

offlexa Iredale 1931, Rec. Aust. Mus., 18, p. 229, pl. 25, figs. 15-16.

One dead specimen in 90-100 fathoms east of Tuggerah Lakes; one live specimen in 72 fathoms off Point Newcastle; four live specimens off Broken Bay, depth unknown; three live specimens off Stanwell Park and three off Port Kembla, depths unknown.

grandiosa Iredale 1931, Rec. Aust. Mus., 18, p. 228, pl. 25, f. 19-20.

One dead specimen off Cape Moreton.

Russetia dilaniatus gen. et sp. nov.

(Pl. 1, figs. 11a, b.)

Remarks: The outstanding characteristic of this new genus is the rough and irregular nature of the peripheral keel in the later whorls, coupled with the peculiar base, convex in the centre and flattening towards the edges, otherwise the general appearance of the shell is fairly typical of the family.

Description: Shell depressed, of seven slightly concave whorls; planate protoconch; base convex, flattening towards periphery and umbilicus; umbilicus large and perspective, one-third total width of shell; edges finely beaded in earlier whorls, becoming rough and irregular as main whorl is reached; peripheral keel simple, becoming rough and irregular as maturity is reached, overlapping the suture in a more pronounced fashion with each succeeding whorl; sculpture of about nine fine spiral lirae below suture, followed by six further lirae of irregular widths towards peripheral keel, the whole over-ridden by fine growth lines; sculpture of base consists of three fairly prominent beaded ridges adjoining umbilicus, followed by two flattened ridges and numerous finer ridges towards periphery, the

whole crossed by fairly pronounced growth striae; columella sinuate and aperture narrows towards keel; colour very light fawn, base white.

Dimensions: Holotype, major diameter 43 mm., minor diameter 37 mm., height 16 mm.

Type Locality: Trawled in 160 fathoms east of Newcastle.

Type: Holotype, the only known specimen, presented to Australian Museum, Sydney, where it is registered No. C. 63345.

FAMILY FASCIOLARIIDAE

PLEIA Finlay 1930, Trans. New Zeal. Inst., 61, p. 60, type species by original designation *decipiens* Tate.

bakeri Gatliff & Gabriel 1912, Vict. Nat., 29, No. 3, p. 47, pl. 4, f. 5.

A fair number of live specimens in depths from 35 to 60 fathoms from Broken Bay to Twofold Bay.

FAMILY FUSINIDAE

FUSINUS Rafinesque 1815, Analyse Natur., p. 145, new name for *Fusus* Lamarck 1799, (not *Fusus* Helbling 1779), type species by monotypy *colus* Linne.

novaeollandiae Reeve 1848, Conch. Icon., 4, *Fusus*, pl. 18, f. 70.

Three fine specimens from 45 fathoms off Port Kembla, all very nodular and heavy; one dead specimen off Twofold Bay.

novaeollandiae grandiculus Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 267, pl. 34, f. 9.

Many specimens obtained along most of N.S.W. coast from Norah Head southwards in various depths up to 160 fathoms and in various stages of growth.

PROPEFUSUS Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 268, type species by monotypy *pyrulatus* Reeve.

pyrulatus Reeve 1847, Conch. Icon., 4, *Fusus*, pl. 3, figs. 50, 50a.

One immature specimen in 60 fathoms east of Port Kembla; one dead specimen off Broken Bay

FAMILY AUSTROSIPHONIDAE

LARGISIPHO Iredale 1929, Rec. Aust. Mus., 17, p. 182, type species by original designation *spectandus* Iredale.

maximus Tryon 1881, Man. Conch., 3, p. 135, pl. 54, f. 355.

Fairly numerous in depths from 30 to 125 fathoms from Port Stephens to Bass Strait.

BERYLSMA Iredale 1924, Proc. Linn. Soc. N.S.W., 49, p. 267, type species by original designation *waitiei* Hedley.

waitiei Hedley 1903, Mem. Aust. Mus., 4, p. 373, pl. 37.

Seven live specimens in 75 fathoms off Broken Bay-Newcastle area.

FAMILY COLUBRARIIDAE

COLUBRARIA Schumacher 1817, Essai nouv. syst. Vers. test. p. 251, type species by monotypy *granulata* Schumacher.

Colubraria fantomei sp. nov.

(Pl. 1, fig. 5.)

Remarks: A most interesting addition to this somewhat difficult group was trawled in 40 fathoms east of Caloundra and is typical of the genus, bearing a strong resemblance to *Colubraria comptus* Sowerby but with finer sculpture. Three specimens were recently obtained, and whilst from another source not connected with "Challenge" material, it is considered that the species should be included with this list in view of the further species later described, trawled by m.v. "Challenge" off Broken Bay, N.S.W., in order to show the essential differences.

Description: Shell a typical *Colubraria*, spire longer than aperture, whorls convex, sutures impressed; one smooth whorl of protoconch only present, upper whorls missing, and this merges imperceptibly into sculpture of main whorls, which number eleven on holotype in addition to protoconch; varices number eighteen, spaced a little more than half a whorl apart, gradually increasing in distance until outer lip on last whorl is almost level with previous varix; aperture 40% of total length of shell, outer lip expanded and recurved, extended a little over previous whorl, finely dentate within, teeth being prolonged well into aperture; columella smooth and sinuate, inner lip much expanded and reflected; anterior canal open and well recurved; a rather obsolete ridge at top of columella suggests a posterior canal; sculpture of fairly fine revolving lirae, crossed by longitudinal striations which are slightly more prominent, giving a general granulated appearance; colouration pale fawn, with slightly darker fawn band in centre of each whorl, forming a dark patch on lower end of each varix; broken irregular revolving brown lines persist in addition over entire shell.

Dimensions: Holotype, length 75 mm., breadth 28 mm., length of aperture 30 mm. The two smaller specimens, both apparently mature, measure 58 mm. long and 22 mm. wide.

Type Locality: All specimens trawled in 40 fathoms east of Caloundra, Q.

Types: Holotype presented to Australian Museum, Sydney, where it is registered No. C. 63346, one paratype presented to National Museum of Victoria, Melbourne; further paratype in author's collection.

*Colubraria myuna** sp. nov.

(Pl. 1, fig. 6.)

Remarks: Whilst it is always preferable to have a series of shells for study before describing a new species, and whilst the shell here described is fairly close in many ways to the species described above, it is considered that the differences are such as to warrant separation.

Description: Species essentially the same in general characteristics as *Colubraria fantomei* and may be described as a degenerate form, main

*An aboriginal word meaning "clear water".

difference being that shell is a considerably smaller species, sculpture less pronounced, tending to decrease more in prominence with each succeeding whorl, this being especially noticeable on varices; although whorls are also convex, sutures are not so impressed, teeth are not produced into interior of aperture, and anterior canal is less recurved; protoconch of three smooth tightly coiled whorls; small columella ridge is absent; colouration very similar to *fantomei* but markings paler and less pronounced.

Dimensions. Holotype, length 41 mm., breadth 15½ mm., length of aperture 17 mm.

Type Locality: Trawled in 75 fathoms east of Broken Bay, N.S.W.

Type: Holotype, the only known specimen, presented to Australian Museum, Sydney, where it is registered No. C. 63347.

BENTHINDSIA Iredale 1936, Rec. Aust. Mus., 19, p. 317, type species by original designation *problematica* Iredale.

problematica Iredale 1936, Rec. Aust. Mus., 19, p. 318, pl. 23, f. 7.

Found in fair numbers from 70 fathoms and over off Broken Bay, all dead specimens; one dead specimen off Botany Bay; four dead specimens off Stanwell Park, depths unknown.

FAMILY MURICIDAE

PTEROCHIELUS Jousseaume 1879, Le Naturaliste, 1, No. 42, p. 335, type species by original designation *acanthopterus* Lamarck.

acanthopterus Lamarck, 1816, Encycl. Meth., vers., pl. 417, f. 2.

One live specimen off Moreton Is., depth unknown.

diffusi Iredale 1936, Rec. Aust. Mus., 19, p. 323, pl. 23, f. 11.

A number of fine specimens obtained, many alive, in fairly deep water from Newcastle to Twofold Bay.

damicornis Hedley 1903, Mem. Aust., Mus., 4, p. 378, f. 92.

Proved to be extremely common and brought up in quantities from Newcastle Bight to Twofold Bay, more particularly from Broken Bay to Port Kembla area, in varying depths from 35 to 126 fathoms; nine specimens also off Cape Moreton, in unknown depth.

HAUSTELLUM Schumacher 1817, Essai nouv. syst. Vers. test., pp. 64 & 213, type species by tautonymy *Murex haustellum* Linne.

espinosus Macpherson 1959, Mem. Nat. Mus. Melb., p. 51, pl. on p. 56, figs. 1, 1a.

Two dead specimens off Cape Moreton, depth unknown; two dead specimens in unknown depth N.N.E. of Cape Byron.

TORVAMUREX Iredale 1936, Rec. Aust. Mus., 19, p. 323, type species by original designation *denudatus* Perry.

denudatus Perry 1811, Conchology, pl. 7, f. 2.

One live specimen in 33 fathoms off Deal Is., Bass Strait; three dead specimens from 45 fathoms east of Broken Bay. Contrary to Iredale's remark in his description of *denudatus immunitus* Iredale (Rec. Aust. Mus., 19, 1936, p. 324, pl. 23, f. 14), that this sub-species from deep water shows "the single inter-variceal nodule of the shore shells", these three specimens all show the double inter-variceal nodules of the true *denudatus* Perry. On the other hand there is in the author's collection a specimen with single nodules only from 40 fathoms off Wollongong, but more fronded than most shore dwelling forms, whilst other specimens from Balmoral, Port Jackson, show in some cases very little frilling and have single and double nodules alternately, so that *immunitus* Iredale must be regarded as a synonym.

EUPHYLLON Jousseaume 1880, Le Naturaliste, 1, No. 42, p. 335, type species by original designation *monodon* Sowerby.

cervicornis Lamarck 1822, Hist. Anim. s. Vert., p. 163.

One live specimen off Cape Moreton.

POIRIERIA Jousseaume 1880, Le Naturaliste, 1, No. 42, p. 335, type species by original designation *zelandicus* Quoy & Gaimard.

*Poirieria kurranulla** sp. nov.

(Pl. 2, fig. 4.)

Remarks: This species, so far as known, has only been found in a fairly confined area. The author has a number trawled in 40 fathoms east of Caloundra, Q., and the within described specimen, the only one received from m.v. "Challenge", was marked as "off Cape Moreton", which is within a few miles of the same locality. Appears to be a fairly close relative of *Poirieria zelandicus* Quoy & Gaimard, from New Zealand waters.

Description: Shell of medium size, spire acuminate, sutures impressed; two whorled bulbous protoconch with somewhat oblique nucleus, terminating in a small varix; main whorls five; canal long, curved, and nearly closed; aperture oval, columella sinuate with callused and reflected inner lip, outer lip smooth with small anal groove; sculpture of irregular spiral lirae both above and below the fairly well defined shoulder on each whorl, crossed by irregular growth lines, persisting along full length of canal; two rows of long fairly straight spines produced from each varix and encircle body whorl, upper row being longer, and continuing in centre of smaller whorls, a rather obsolescent nodular formation occurs between the spines; three short curved spines occur on anterior canal; colour uniform pale fawn, inner and outer lip white, interior of aperture light pinkish purple; shell covered in young stages with furry greyish-fawn periostracum, which tends to disappear in mature shell; operculum oval, reddish-brown, with well defined overlapping growth lines and terminal nucleus.

*An aboriginal word meaning "a small pink sea shell".

Dimensions: Holotype, length 42 mm., breadth 13 mm., length of aperture 8 mm., canal 20 mm., longest spine 18 mm.

Type Locality: Trawled off Cape Moreton, Q., exact depth unknown.

Type: Holotype registered at National Museum of Victoria, Melbourne, No. F. 21118; several paratypes from 40 fathoms east of Caloundra presented to Australian Museum, Sydney, and National Museum of Victoria, Melbourne.

FAMILY TROPHONIDAE

EMOZAMIA Iredale 1929, Rec. Aust. Mus., 17, p. 185, type species by original designation *licina* Hedley & Petterd.

licina Hedley & Petterd 1906, Rec. Aust. Mus., 6, p. 219, pl. 37, f. 6.

Several large live specimens from 35-50 fathoms off Botany Bay, Port Kembla, Bermagui and Twofold Bay.

XENOTROPHON Iredale 1929, Rec. Aust. Mus., 17, p. 184, type species by original designation *euschema* Iredale.

euschema Iredale 1929, Rec. Aust. Mus., 17, p. 184, pl. 40, f. 3.

One dead specimen in 60 fathoms east of Broken Bay; one dead specimen in 50 fathoms east of Botany Bay; two dead specimens in 60 fathoms east of Port Kembla.

FAMILY CORALLIOPHILIDAE

TOLEMA Iredale 1929, Rec. Aust. Mus., 17, p. 186, type species by original designation "*sertata* Hedley" = *australis* Laseron 1955.

australis Laseron 1955, Proc. Roy. Zool. Soc. N.S.W., 1953-54, p. 72, figs. 1-2.

A fair number of well grown live specimens in 50 to 70 fathoms in many places along the coast from Newcastle to Twofold Bay; immature live specimens fairly numerous off Port Kembla.

FAMILY COMINELLIDAE

BEDEVA Iredale 1936, Rec. Aust. Mus., 19, p. 273, type species by original designation *hanleyi* Angas.

hanleyi Angas 1867, Proc. Zool. Soc. Lond., p. 110, pl. 13, f. 1.

Two dead specimens off Botany Bay; one dead specimen off Port Kembla.

FAMILY COLUMBARIIDAE

COLUMBARIUM Martens 1881, Conch. Mittheil., 2, p. 105, type species by monotypy *spincinctum* Martens.

hedleyi Iredale 1936, Rec. Aust. Mus., 19, pp. 315-6, pl. 24, f. 18, 18a.
(= *trabeatum* Iredale 1936.)

Shells obtained in fair numbers from Newcastle-Broken Bay area in depths from 90 to 160 fathoms. The number of ridges below the periphery varies from one to five, and the peripheral flange shows teeth both increasing and decreasing in size. The shell is

variable and *trabeatum* Iredale (Rec. Aust. Mus. 19 (5), 1936, p. 316, pl. 23, f. 17) must now be regarded as a synonym. The operculum of this species, not formerly described, is corneous, pear shaped, chestnut brown in colour, vertically grooved, with a terminal nucleus.

FAMILY TEREBRIDAE

ACUMINIA Dall 1908, Nautilus, 21, pp. 124-5, type species by original designation *lanceata* Lamarck.

lauretanae Tenison-Woods 1878, Proc. Linn. Soc. N.S.W., 2, p. 262.

One dead immature specimen in 70 fathoms east of Port Kembla.

TRIPLOSTEPHANUS Dall 1908, Nautilus, 21, pp. 124-5, type species by original designation *triseriatus* Gray.

praelongus Deshayes 1859, Proc. Zool. Soc. Lond., p. 135.

One dead specimen in 110-142 fathoms east of Newcastle; one dead specimen in 156-160 fathoms east of Newcastle; one dead specimen in 100-126 fathoms, 40 miles E.N.E. of Sydney.

FAMILY CONIDAE

FLORACONUS Iredale 1930, Mem. Q. Mus., 10, (1), p. 80, type species by original designation *anemone* Lamarck.

angasi Tryon 1884, Man. Conch., 6, p. 62, pl. 19, f. 99.

Two live specimens in 75 fathoms east of Stanwell Park.

*Floraconus wallangra** sp. nov.

(Pl. I, fig. 3.)

Remarks: This species has presented some problems regarding its general shape and appearance, and more particularly as regards its very variable colour pattern. Also, a number of specimens received for study from as far north as Moreton Is., Q., are apparently all somewhat immature, but at the same time agree well in general shape and appearance with the one immature specimen received from m.v. "Challenge" from 75 fathoms east of Stanwell Park, together with two larger and mature shells.

Description: Shell medium size, light in weight, fairly straight sided, shoulders fairly sharply angled, aperture straight and linear, spire elevated and a little concave; protoconch two whorled and papillate, main whorls seven in number and concave; sculpture of rows of finely punctate lines at regular intervals on body whorl, tending to disappear with age, merging into oblique irregular ridges at anterior end; sculpture on spire of five or six fine but pronounced spiral lirae on each whorl, crossed by faint growth striae; colour medium brown on off-white ground, sometimes tinged with blue, in form of irregular blotches and maculations, tending to form two broad bands of brown round body whorl. In northern specimens these two bands tend to be more distinct than in southern specimens, whilst southern ones have revolving rows of irregular brown spots which tend

*An aboriginal word meaning "big water".

to become indistinct or even disappear in specimens from the north; whole of spire flamed with same brown colouration; interior of aperture tinged with blue in varying degrees.

Dimensions: Holotype, length 34 mm., breadth 19 mm., length of aperture 29 mm.

Type Locality: Trawled in 75 fathoms east of Stanwell Park, N.S.W.

Types: Holotype presented to Australian Museum, Sydney, where it is registered No. C. 63323, with one immature paratype; one paratype presented to National Museum of Victoria, Melbourne, one paratype in author's collection.

ENDEMOCONUS Iredale 1931, Rec. Aust. Mus., 18, p. 225, type species by original designation *howelli* Iredale.

howelli Iredale 1929, Rec. Aust. Mus., 17, p. 182, pl. 40, figs. 1, 8.

One dead specimen off Moreton Is., one south of Cape Moreton; one dead specimen off Broken Bay; two mature live and two smaller dead specimens in 70 fathoms off Stanwell Park.

A further specimen taken alive off Stanwell Park and a little more than half grown, shows strong spiral lirae encircling entire body whorl, and close examination shows faint traces of spiral lirae in places on a number of other specimens examined, as mentioned in original description, this feature tending to diminish or disappear entirely as maturity is reached. Striated specimen also tends towards a coronated spire, very small nodules on anterior end of body whorl, and has a fine chestnut periostracum. Coloration of this species is most variable, from pale chestnut to dark brown in live specimens, paler specimens having also a paler periostracum; patterning can vary from all-over blotched appearance of brown on whitish ground, to two or three distinct brown bands of blotches with spotting between, whilst others have fine wavy longitudinal brown lines; spire also can vary from being highly elevated as in type, to almost flat in some specimens sent for study from northern N.S.W. coast; interior of shell suffused with pale pink fading to white at either extremity.

RHIZOCONUS Morch 1852, Cat. Conch. Yoldi., p. 68, type species by subsequent designation (Iredale 1930, Mem. Q. Mus., 10, p. 80) *miles* Linne.

Rhizoconus advertex sp. nov.

(Pl. 1, fig. 1.)

Remarks: Two specimens of this shell were obtained N.N.E. of Cape Byron, N.S.W., one off Moreton Is., Q., and a number of others later sent for study from deep water also from off Moreton Is. The species bears a resemblance in some ways to *Floraconus angasi* Tryon, but the consistent and distinctive colour pattern coupled with the fairly flat spire, broad, sharply angled shoulders and straight sides, leave no doubt as to its separate identity, in addition to which the localities where these two species have been found do not appear to overlap.

Description: Shell rather small but typical of the genus, sides fairly straight, shoulders sharply angled, mouth narrow, straight and linear, spire slightly elevated but with prominent protoconch; protoconch is papillate, smooth and translucent, of three whorls, and merges gradually into main whorls, which number six; main whorls slightly concave, with five or six well defined spiral striations crossed by fine growth lines; rows of very fine punctate spots faintly discernible on body whorl in most specimens, merging into well defined oblique ridges at anterior end, spaces between these ridges also having a punctate appearance; coloration of a whitish background, in some cases suffused with pink in varying degrees, with revolving rows of square or elongated spots; outstanding feature of colour pattern consists of two narrow bands of pinkish-brown over-riding two bands of large irregular dark brown blotches; spire flamed with reddish brown, interior white, sometimes suffused with pink.

Dimensions: Length of type 30 mm., breadth 19 mm.

Type Locality: Trawled in 80 fathoms off Moreton Is., Q.

Types: Holotype presented to Australian Museum, Sydney, where it is registered No. C. 63348, with one paratype; a further two paratypes held by National Museum of Victoria, Melbourne.

LEPTOCONUS Swainson 1840, Treat. Malac., p. 312, type species by subsequent designation (Herrmannsen 1847, Ind. Gen. Malac., 1, p. 584). *amadis* Martini (= *amadis* Gmelin).

*Leptoconus illawarra** sp. nov.

(Pl. 1, fig. 2.)

Remarks: This species bears a fairly close resemblance to *Leptoconus eximius* Reeve from the Moluccas, the main difference being in the sculpture of the body whorl. Both shells are encircled by finely punctate lines, but whilst intervening spaces in this new species are quite flat and lines are only present from centre of body whorl to anterior end, intervening spaces in *eximius* Reeve consist of strong ridges and extend over whole of body whorl. Markings on this new species are also lighter and more orange in colour compared with the deep reddish-orange of *eximius*.

Description: Shell typical of the genus, conic, fairly straight sided, straight linear mouth, spire well elevated and concave; papillate protoconch of three whorls, smooth and translucent, and merges imperceptibly into body whorls, which number six; sculpture on spire usually of three fairly prominent spiral lirae on each whorl, crossed by well defined growth lines; anterior end of body whorl encircled by regularly spaced finely punctate lines, intervening spaces being flat at first but becoming more ridged and whole of this sculpture more oblique towards anterior end; colouration of encircling bands of orange-brown spots and blotches on off-white ground; spire similarly blotched, interior of aperture pinkish-orange, anterior end of columella white.

*An aboriginal word meaning "a pleasant place".

Dimensions: Holotype, length 29 mm., breadth 15 mm., length of aperture 22 mm.

Type Locality: Trawled in 75 fathoms east of Stanwell Park, N.S.W.

Types: Holotype presented to Australian Museum, Sydney, where it is registered No. C. 63349 with three paratypes; three paratypes presented to National Museum of Victoria, Melbourne; three paratypes in author's collection.

MAMICONUS Cotton & Godfrey 1932, South Aust. Nat., 13, p. 69, type species by monotypy *superstes* Hedley.

*Mamiconus minnamurra** *sp. nov.*

(Pl. 1, figs. 4a, b.)

Remarks: This species could conceivably grow larger than the holotype, there being no indication to show whether or not the shell is near maturity, and unfortunately, the lip of the holotype is broken. However it adds a most interesting species to this genus, formerly represented by the type species only.

Description: Shell typically conic in general appearance, spire slightly elevated, of six concave whorls and pronounced papillate protoconch of $1\frac{1}{2}$ whorls; spiral whorls finely spirally striate, crossed by fairly prominent growth lines, with well defined shoulder present above each suture; sides of shell slightly concave towards anterior end; sculpture on body whorl of strongly defined spiral lirae, the whole crossed by very fine vertical lines; fine pale brown periostracum present; colour off-white with three irregular bands of brown blotches encircling body whorl; a row of brown spots just below shoulder, continuing between shoulder and suture on each whorl of spire; interior of shell has slight bluish tinge and protoconch translucent white.

Dimensions: Holotype, length 26 mm., breadth 14.5 mm., length of aperture 21 mm.

Type Locality: Trawled in 60 fathoms east of Botany Bay, N.S.W.

Types: Description based on holotype and one paratype, both presented to Australian Museum, Sydney, where they are registered No. C. 63350.

FAMILY TURRIDAE

TURRIS Muller 1766, Delic. Nat. Selectae, 1, p. 129, type species by original designation *Murex babylonius* Linne.

Turris binda† *sp. nov.*

(Pl. 1, fig. 7.)

Remarks: Only one specimen is so far known of this species, which appears to be by far the largest ever taken on the New South Wales coast, and a remarkable find in water so far south, the genus generally being considered strictly tropical.

*An aboriginal word meaning "plenty of fish".

†An aboriginal word meaning "deep water".

Description: Shell large, heavily built, with tall slender spire, eleven main whorls, apical whorls missing; outer lip, although damaged, appears to have been sharp, without any folding or thickening, and sinus on peripheral keel; fourteen well defined raised revolving threads visible within aperture; anterior canal fairly long and straight, small portion missing; whorls sharply angled at periphery, with a broad concave shoulder and well rounded base; sculpture consists of numerous well defined revolving lirae, interspersed with finer threads, crossed by oblique growth lines veering to right above periphery and to left below it, where sculpture has a general granulated appearance; one well defined thread prominent just below suture, two other fairly smooth prominent threads form the peripheral keel, whilst sculpture generally tends to become smoother towards anterior end of shell; colour consists of chestnut spots on prominent thread below suture and on periphery, with more general blotching on lower part of main whorl; background and interior of aperture white.

Dimensions: Holotype, length 77 mm., breadth 25 mm., length of aperture 34 mm.

Type Locality: Trawled in 75 fathoms off Broken Bay, N.S.W.

Type: Holotype, the only known specimen, presented to Australian Museum, Sydney, where it is registered No. C. 63351.

TURRICULA Schumacher 1817, Essai nouv. syst. Vers. test., p. 217, type species by original designation *flammea* Schumacher 1817.

*Turricula murrayolga** sp. nov.

(Pl. 1, fig. 8.)

Remarks: Like the preceding species, this is another find of a genus normally regarded as only inhabiting tropical waters, and is once again indicative of the large field for further research which probably exists in the somewhat deeper waters of our coast. The species is strongly reminiscent of *Turricula kaderleyi* Lischke from Japan in general appearance.

Description: Shell fairly large, comparatively thin, regularly fusiform with long slender spire, main whorls eight in number; protoconch of two whorls, transparent, merging imperceptibly into first main whorl; canal long, straight and open, aperture approximately half total length of shell; outer lip thin and probably rounded, but damaged in all four specimens obtained; sculpture of slight evenly spaced revolving threads, crossed by faint growth lines which become a little more prominent on body whorl; posterior sinus just below suture, growth lines veering to right above it and to left below; one row of prominent elongated nodules present, evenly spaced round periphery of each whorl; colour white flamed with dark chestnut, a white patch present in centre and on top of each nodule, and a white band encircles body whorl midway between nodules and anterior end of shell; interior of aperture follows general colouration.

Dimensions: Holotype, length 57 mm., breadth 19 mm., length of aperture 28 mm.

Type Locality: All specimens trawled in 75 fathoms east of Broken Bay, N.S.W.

*An aboriginal word meaning "sheet of deep water."

Types: Owing to missing apical whorls on largest of four specimens obtained and damage to outer lip in all specimens, description based on series as a whole, of which holotype and one paratype presented to Australian Museum, Sydney, where they are registered No. C. 63352; one paratype presented to National Museum of Victoria, Melbourne; one paratype in author's collection.

AUSTROTURRIS Laseron 1954, Rev. N.S.W. Turridae, p. 6, type species by original designation *steira* Hedley.

steira Hedley 1922, Rec. Aust. Mus., 13, p. 224, pl. 42, f. 11.

One dead specimen in 45 fathoms east of Broken Bay.

MICANTAPEX Iredale 1936, Rec. Aust. Mus., 19, p. 319, type species by original designation *agnata* Hedley & Petterd.

agnata Hedley & Petterd 1906, Rec. Aust. Mus., 6, p. 220, pl. 37, f. 3.

Four dead specimens in 45 fathoms east of Broken Bay; one dead specimen east of Port Kembla.

profundis Laseron 1954, Rev. N.S.W. Turridae, p. 8, pl. 1, f. 13.

Two dead specimens east of Broken Bay.

EPIDIRONA Iredale 1931, Rec. Aust. Mus., 18, p. 225, type species by original designation *hedleyi* Iredale.

hedleyi Iredale 1931, Rec. Aust. Mus., 18, p. 225. New name for *Epideira striata* Hedley 1922 (not *E. striata* Gray 1827), Rec. Aust. Mus., 13, p. 230, pl. 43, figs. 18-20.

One dead specimen east of Broken Bay.

BENTHOFASCIS Iredale 1936, Rec. Aust. Mus., 19, p. 319, type species by original designation *biconica* Hedley.

biconica Hedley 1903, Mem. Aust. Mus., 4, p. 385, f. 98.

One dead specimen in 45 fathoms east of Broken Bay.

VEXITOMINA Powell 1942, Bull. Auck. Inst. Mus., 2, p. 77, type species by original designation *metcalfei* Angas.

coxi Angas 1867, Proc. Zool. Soc. Lond., 1867, p. 113, pl. 13, f. 15.

One live specimen in 45 fathoms off Broken Bay.

suavis Smith 1888, Ann. Mag. Nat. Hist., (6), 2, p. 305.

Two dead specimens off Botany Bay.

FILODRILLIA Hedley 1922, Rec. Aust. Mus., 13, p. 220, type species by original designation *tricarinata* Tenison-Woods.

tricarinata Tenison-Woods 1878, Proc. Linn. Soc. N.S.W., 2, p. 265.

Three dead specimens in 45 fathoms off Broken Bay.

AUSTROCARINA Laseron 1954, Rev. N.S.W. Turridae, p. 21, type species by original designation *recta* Hedley.

recta Hedley 1903, Mem. Aust. Mus., 4, p. 386, f. 99.

Two immature specimens in 45 fathoms off Broken Bay.

ETREMA Hedley 1918, J. Roy. Soc. N.S.W., 51, Suppl., p. M79, type species by original designation *aliciae* Melvill & Standen.

densaplicata tasmanis Laseron 1954, Rev. N.S.W. Turridae, p. 27, pl. 6, figs. 122-124.

One dead specimen off Botany Bay.

ASPERDAPHNE Hedley 1922, Rec. Aust. Mus., 13, p. 338. (New name for *Scabrella* Hedley 1918, not *Scabrella* Sacco 1890.) Type species by original designation *versivestita* Hedley.

hayesiana Angas 1871, Proc. Zool. Soc. Lond., 1871, p. 17, pl. 1, f. 17.

One dead specimen off Broken Bay.

VEPRECULA Melvill 1917, Proc. Malac. Soc., 12, pp. 141, 188, type species by original designation *sykesii* Melvill & Standen.

vepratrica Hedley 1903, Mem. Aust. Mus., 4, p. 384, f. 97.

One dead specimen in 45 fathoms off Broken Bay.

SUBCLASS OPISTHOBRANCHIA

FAMILY SCAPHANDRIDAE

ADAMNESTIA Iredale 1936, Rec. Aus. Mus., 19, p. 333, type species by original designation *peroniana* Iredale (= *regularis* Gould).

thetidis Hedley 1903, Mem. Aust. Mus., 4, p. 395, f. 111.

Six live specimens off Botany Bay.

FAMILY ARMINIDAE

ARMINA Rafinesque 1814, Precis decouv. trav. Somiol, p. 30, type species by subsequent designation (Iredale and O'Donoghue 1923, Proc. Malac. Soc., 15, p. 217) *tigrina* Rafinesque (= *Pleurophyllidia* Meckel, 1823, Archiv. Anat. Phys., 8, p. 190, type species by monotypy *lineata*).

cygnea Bergh 1876, Malak. Blatt., 23, p. 9, pl. 1, figs. 1-7.

One live specimen in 50-60 fathoms east of Newcastle.

FAMILY PHILINIDAE

PHILINE Ascanius 1772, K. Vet. Acad. Handl. (Stockh.), 33, p. 331, type species by monotypy *aperta* Linne.

angasi Crosse & Fischer 1865, J. de Conch., 13, p. 38, pl. 2, f. 8.

One live specimen in 32 fathoms east of Terrigal.

CLASS SCAPHOPODA

FAMILY DENTALIIDAE

DENTALIUM Linne 1758, Syst. Nat. ed. 10, p. 758, type species by subsequent designation (Montfort 1810, Conch. Syst., 2, p. 55) *elephantinum* Linne.

S.g. *EPISIPHON* Pilsbry & Sharp 1897, Man. Conch. (Tryon), 17, pp. 31, 117, type species by subsequent designation (Suter 1913, Man. New Zeal. Moll., p. 821) *sowerbyi* Guilding.

virgula Hedley 1903, Mem. Aust. Mus., 4, p. 328, f. 2.

Numerous specimens obtained, some alive, in 74-75 fathoms east of Botany Bay.

CLASS CEPHALOPODA

SUBCLASS DIBRANCHIA (= COLEOIDEA)

FAMILY SEPIIDAE

SUBFAMILY SOLITOSEPIINAE

DECORISEPIA Iredale 1926, Aust. Zool., 4, p. 193, type species by original designation *rex* Iredale.

rex Iredale 1926, Aust. Zool., 4, p. 193, pl. 22, f. 9-10.

Two live specimens in 76-80 fathoms east of Lake Macquarie.

GLYPTOSEPIA Iredale 1926, Aust. Zool., 4, p. 191, type species by original designation *opipara* Iredale.

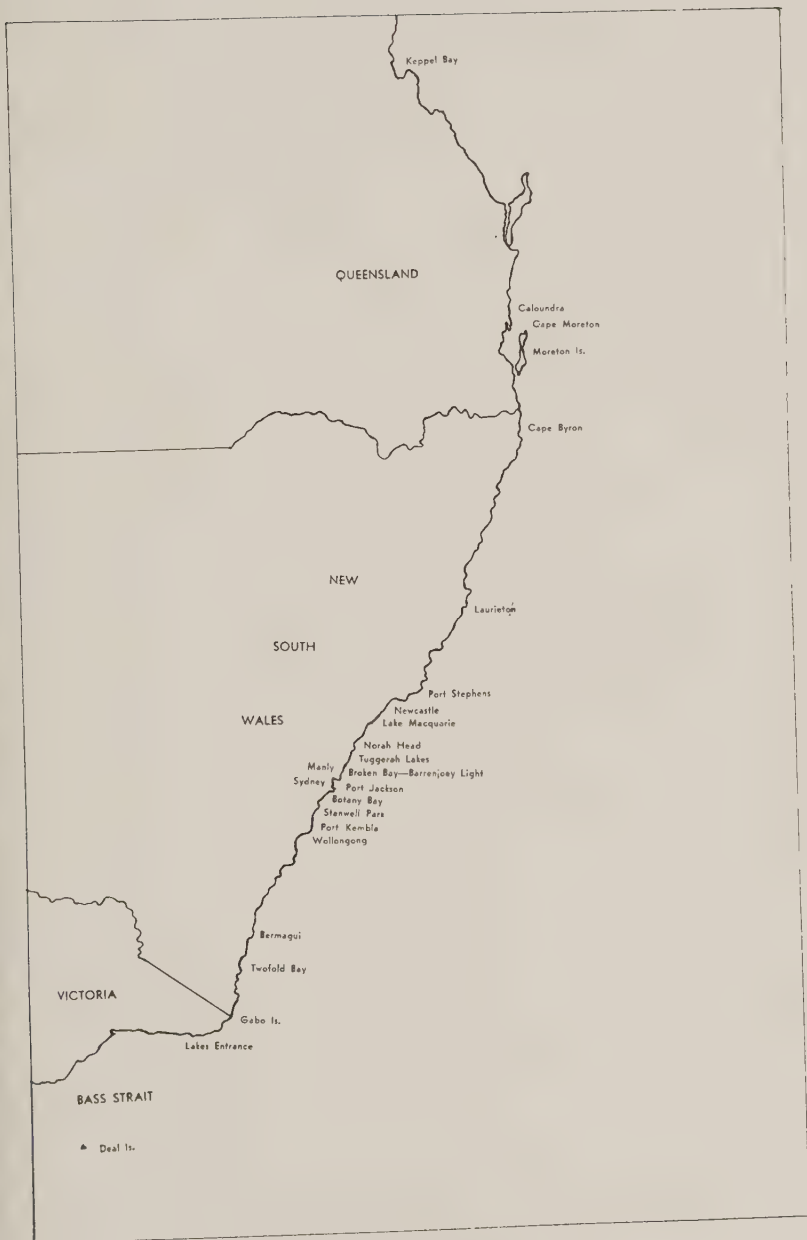
cultrata Hoyle 1885, Ann. Mag. Nat. Hist., (5), 16, p. 198.

Two live specimens in 156-160 fathoms east of Newcastle.

ARCTOSEPIA Iredale 1926, Aust. Zool., 4, p. 193, type species by original designation *limata* Iredale.

versuta Iredale 1926, Aust. Zool., 4, p. 193, pl. 23, f. 5-6.

Twelve live specimens in 76-80 fathoms east of Lake Macquarie; one live specimen in 96 fathoms east of Tuggerah Lakes.



COMPARATIVE TABLE OF CHARACTERS

Genus <i>Liolophura</i> .		<i>japonica</i>	<i>japonica</i> , form <i>tenuispinosa</i> °	<i>gaimardi</i>	<i>gaimardi</i> , form <i>platispinosa</i> °	<i>hirtosa</i>
Species:						
Insertion Plates		8, 10, 11, 12-1-0	11-1-0	8, 10, 11-1-0	8, 10-1-1 or several	10-1-10
Callus VIII		Smooth, no fissure. Sometimes one slight and narrow lateral projection on each side	Very faintly cross-hatched One (or two) lateral fissures, rather deep on each side	Smooth, no fissure Sometimes one slight and narrow lateral projection	No callus in the strict sense Two spec., each with two deep fissures on each side. One spec., with 7 short lamellae superficial, sometimes none in the intermediate region	Smooth, flat sometimes lightly cross-hatched One spec., with one inclined lamella and one curved lateral notch. One spec., with inclined and oblique lamellae.
Lateral region		Little pectinated.	Pectinated	Not pectinated	Teeth well pectinated	Little pectinated
Sculpture		Rather smooth, somewhat granular.	Rather smooth, somewhat granular	Delicate granules, irregularly elongated in radial rows	Irregular granules	Irregular granules rather thick, elongated in radial rows
Zones of Growth: Lateral Area		More or less connected and close together.	Rather large and thick	Large, rather thick	Large	Large and thick
Jugum and Median Area		More or less smooth	Large and flat	Narrow	Narrow	More or less large, flat
Girdle, upper surface, large spines		Of equal length. More or less thick cylindrical or flattened.	Of equal length. Slender, cylindrical	Of different lengths, more or less cylindrical	Of different lengths, much enlarged	Of equal length, large and short
Dimensions in mm.		35 x 21: Lischke 36 x 25 } Taki 68 x 43 } 22.5 x 16 } 32 x 19 } Leloup	65 x 48 70 x 47 } 74.5 x 47 } Leloup	45 x 25: Iredale 23.5 x 16 } 35 x 27.5 } Leloup	18.5 x 13 21 x 11 30 x 18.5 } Leloup	65 x 35: Hull, max. 46 x 28.5 52 x 30 } 40 x 29 } Leloup
Origin		Japan and vicinity	Indo-China and vicinity	Australia to the Malayan Archipelago, Atlantic coast of Africa.	Shikok (Japan) Tonkin	From South-West Australia to the Abrolhos and Dirk Hartog Islands

° See E. Leloup, 1939, Bull. Mus. roy. Hist. Nat. Belg., 15, 1.

SPECIES OF THE GENUS *LILOPHURA* PILSBRY, 1893 (MOLLUSCA, POLYPLACOPHORA)

By EUGENE LELOUP, D.Sc.*

The genus *Liolophura* includes particularly three species, *L. japonica* (Lischke, 1873), *L. gaimardi* (Blainville, 1825) and *L. hirtosa* (Blainville, 1825) representatives of which display many analogies between each other: the oval, elongate form; the shell little elevated; the sculpture differentiated on the median and lateral areas, less pronounced on the lateral areas and composed of granules, more or less thick, abundant and regularly arranged; the growth striae well marked; the coloration rather dull, varied by more or less extensive lighter regions, with a narrow brown band always present on the jugum of valves II-VII, valve I being divided into three sections, of which the middle, more or less wide, is light coloured. The perinotum is covered on the upper surface with two kinds of spines; the most abundant kind are of varied shape, generally thick, coloured and sculptured with fine, longitudinal granulose ribs; the others are small, slender, elongate, cylindrical, with very fine longitudinal ribs, and plentifully covered with brown pigment; at its marginal edge, the perinotum bears solid, elongate spines, and on its lower surface, rectangular scales which are thick and curved.

In order to avoid the description of the species which have, moreover, been given perfectly by other authors, it seemed to be more useful to prepare a comparative table in which the distinguishing characters of the species are given, and to follow this with the references and figures, a record of the material observed, the geographical distribution of the species under consideration, and finally some remarks suggested by the study of the specimens.

Liolophura japonica (Lischke, 1873)

(Text figs. 1, 2 and 5a, Pl. 3, fig. 1.)

Liolophura japonica (Lischke, 1873). Taki, Isao, 1938, Sci. Rep. Tohoku Imp. Univ. (4), Biol., 12, No. 3, pp. 398-404, pl. 15, fig. 3, pl. 32, figs. 15, 16, pl. 33, figs. 1-8, pl. 34, figs. 1-4 (bibliography and synonymy).

MATERIAL OBSERVED:

Collection of the Institut royal des Sciences naturelles, Belgium:

Japan (2 specimens, largest 18 x 20.5 mm., curled up). Hirado-Hizen (3 specimens, largest 50 x 26 mm., girdle compressed). Fukura, Awaji (2 specimens, largest 38 x 23 mm., a little curled and girdle compressed). Enoshima (1 specimen, 21 x 14 mm., curled up). Locality? (1 specimen, 26 x 20 mm., curled up).

(Under the name var. *tessellata*): Japan (5 specimens, largest 27.5 x 14 mm., girdle compressed, 22 x 22 mm., curled up and compressed). Yokohama (1 specimen, 34 x 17 mm., girdle compressed).

(Under the name form *tenuispinosa*): See E. Leloup, 1939, Bull. mus. roy. Hist. nat. Belg., 15, 1.

*Institut royal des Sciences naturelles, Brussels, Belgium.

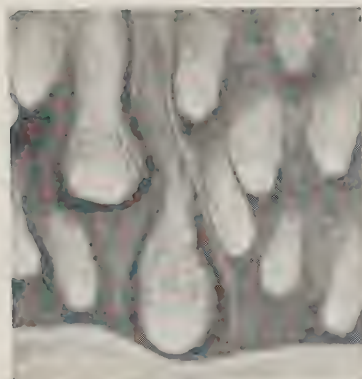


A



B.

FIGURE 1.

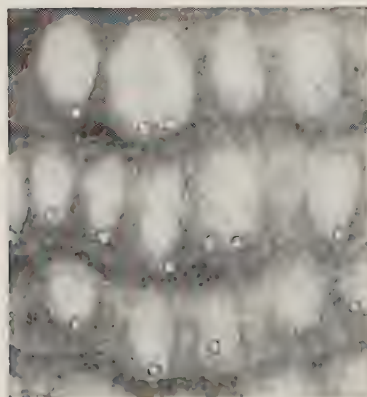


A

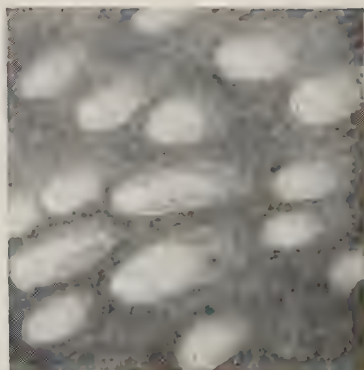


B.

FIGURE 2.



A



B.

FIGURE 3.

PLATE 3.—AESTHETES (Mag. x 120).

Figure 1: *Liolophura japonica* (Lischke, 1873), form *tenuispinosa*.
A—Median area. B—Lateral area.

Figure 2: *Liolophura gaimardi* (Blairville, 1825).
A—Median area, pleura' region. B—jugal region.

Figure 3: *Liolophura gaimardi* (Blainville, 1825), form *platispinosa*.
A—Median area, jugal region. B—Lateral area.

Collection of the British Museum (Natural History), London:

Misaki, sea-level, May, 1921, V. Insole Esq., No. 43, 1921-12-20, 254, 257 (1 specimen, 22.5 x 16 mm.) No. 52, 1921-12-20, 298, 307 (3 specimens, largest 19 x 13.5 mm.). Enoshima, Dr. Anderson, No. 80-12-10, 284-5 (2 specimens, largest 30 x 17 mm., girdle compressed).

Collection of the Zoological Museum, Hamburg:

Fokien, China, 9-IX-1912, Konsul G. Sumssen (20 specimens, largest 34 x 20 mm., girdle compressed, (form *tessellata*). North Formosa, coll. Warburg (2 specimens, largest 27 x 20 mm.).

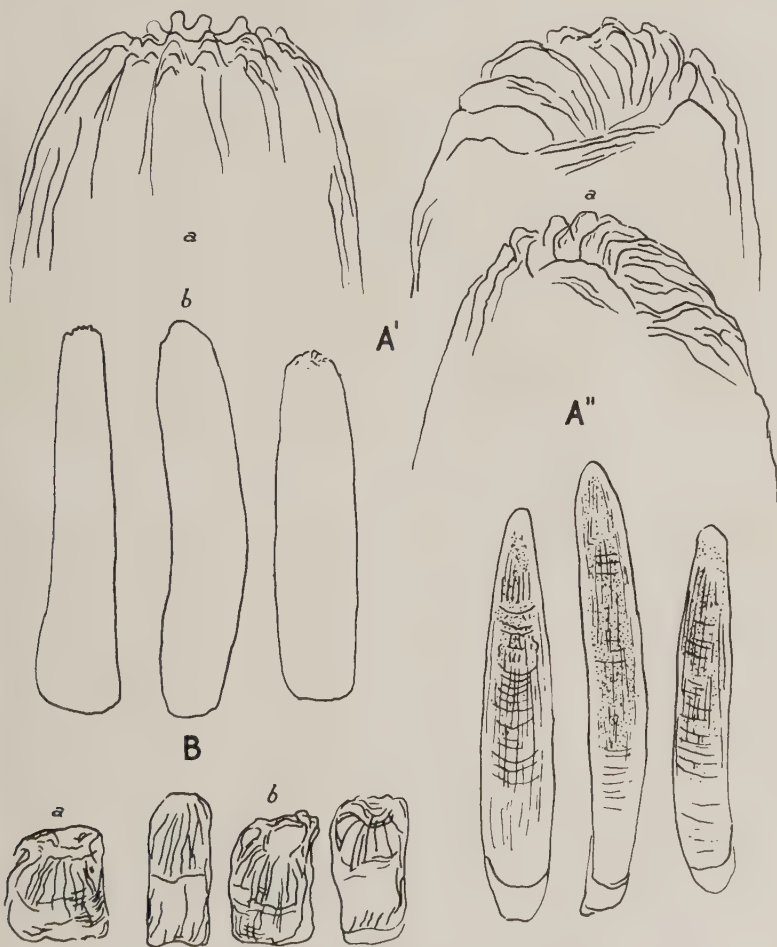


Figure 1: *Liolophura japonica* (Lischke, 1873). Specimen from Hirado-Hizen. Girdle Elements: A—Upper surface: A1—Thick spines. a—Extremities (x 350), b—(x 55). A11—Small spines (x 350). B—Lower surface: a—in the centre, b—near the margin.

GEOGRAPHIC DISTRIBUTION:

See Isao Taki (1938): Japan and vicinity.

Liolophura gaimardi (Blainville, 1825)

(Text figs. 3, 5b, Pl. 3, fig. 2.)

Liolophura gaimardi. Iredale, T., & Hull, A. F. B., 1926, Aust. Zool. 4, p. 262, pl. 37, figs. 13-16, 19, 31 (bibliography and synonymy). Pilsbry, 1894, Proc. Acad. Nat. Sci. Philadelphia, p. 87. Casto de Elera, Fr., 1896, Cat. Sist. Fauna Philipinas, 3, p. 442. Tate, R., and May, W. L.,

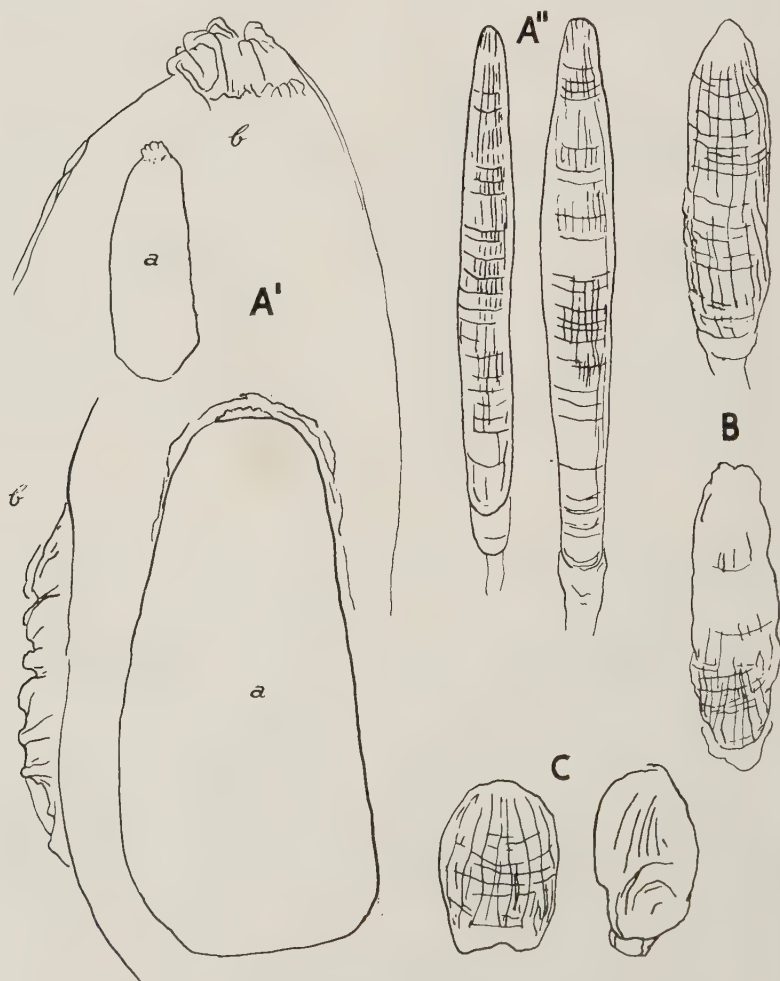


Figure 2: *Liolophura japonica* (Lischke, 1873), var. *tessellata* Pilsbry, 1893. Specimen from North Formosa. Girdle Elements: (Mag. x 350, a— x 55.) A—Upper surface: A1—Two thick spines, a—their respective extremities. A11—Small spines. B—Marginal edge, scaly-spines. C—Lower surface, scales.

1901, Proc. Linn. Soc. N.S.W., 26, p. 415. Hidalgo, J. G., 1904-1905, Catal. Mol. testaceos Filipinas, Jolo y Marianas, 1, p. 272. Nierstrasz, H., 1905, Chitonon Siboga-Exp., 48, pp. 108, 110; 1905, Notes from the Leyden Mus., 25, pp. 154-155, pl. 10, figs. 20, 21. May, W. L., & Torr, W. G., 1912, Pap. Proc. Roy. Soc. Tasmania, p. 40. Ashby, E., 1922, Trans. Proc. Roy. Soc. S. Aust., 46, p. 581; 1926, Rept. Austral. Ass. Adv. Sci., 17,

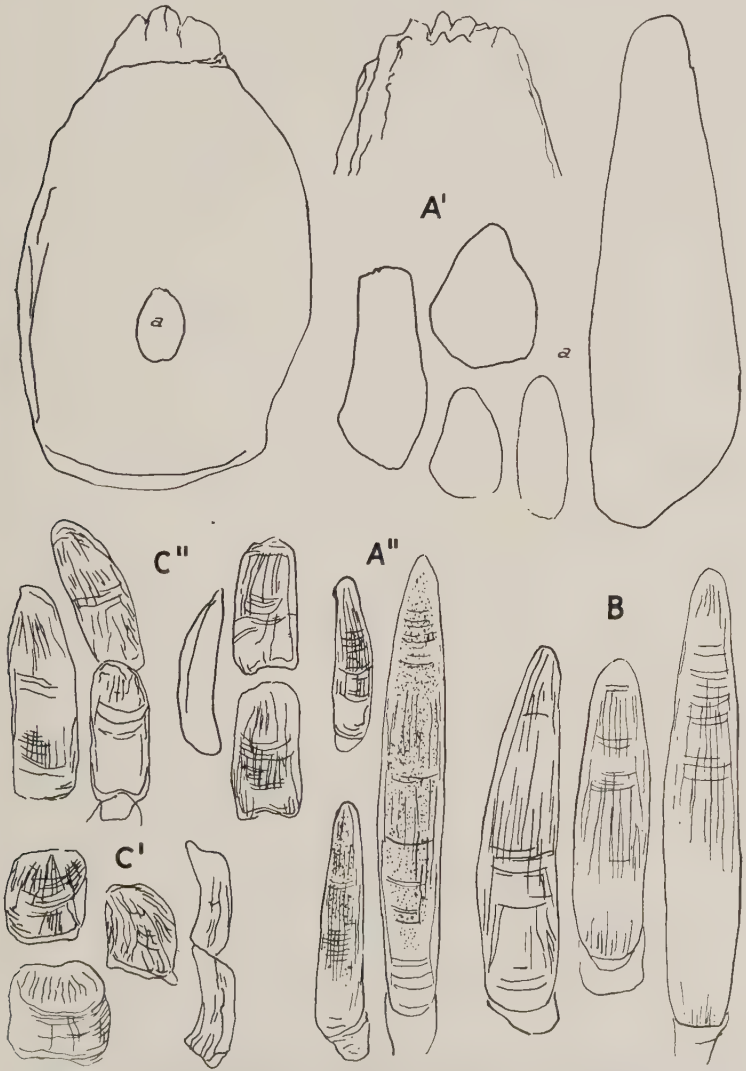


Figure 3: *Liolophura gaimardi* (Blainville, 1825). Girdle Elements. (Mag. x 350). A—Upper surface: A1—Scales (a—x 55). A11—Small pigmented spines. B—Marginal edge, scaly-spines. C—Lower surface, scales: C1—in the centre, C11—near the marginal edge.

pp. 380, 384, 386, 388-9. Bergenhayn, J. R. M., 1930, Kungl. Sv. Vetens. Handlingar, 9, p. 32, pl. 8, figs. 76, 77; 1937, Arch. F. Mollusk, 69, pp. 44-48, figs. 1, 2. Allan, J., 1950. Australian Shells, p. 238, fig. 55 (6a).

Acanthopleura quatrefagei Rochebrune. Pisbry, H., 1892, Man. of Conch., 15, p. 96. Sykes, E. R., 1894, Proc. Mal. Soc. Lond., 1, p. 135. Thiele, J., 1909, Zoologica, 22, p. 8.

Acanthopleura brevispinosa (Sowerby), pars, Ashby, E., 1931, Ann. South African Mus., 30, p. 53.

Liolophura queenslandica Pilsbry. Iredale, T., & Hull, A. F. B., 1926, Aust. Zool., 4, p. 263, pl. 37, figs. 23-25, 30, 32 (bibliography). Hull, A. F. B., 1924, Proc. Roy. Soc. Queensland, 36, p. 109.

MATERIAL OBSERVED:

Collection of the Institut royal des Sciences naturelles of Belgium:

Australia (10 specimens, largest 35 x 23 mm.). South Australia (2 specimens, 33 x 19 mm., girdle compressed, 32 x 18.5 mm. extended). Sydney (1 specimen, 28 x 15.5 mm.). Woolloomooloo (5 specimens, largest 34 x 20 mm., a little curled). Port Jackson (2 specimens, 35 x 20 mm., extended). Mosman Bay (1 specimen, 20 x 17 mm.). Rawak, Papouasie (2 specimens, largest 20 x 14.5 mm., a little curled). British New Guinea (1 specimen, 22 x 14 mm.). Co-type of *A. quatrefagei* (1 specimen, 13.5 x 7.5 mm.). Locality? (2 specimens, largest 32 x 20 mm., extended).

(Under the name form *platispinosa*): See E. Leloup, 1939, Bull. Mus. Hist. Nat. Belg., 15, 1.

Collection of the British Museum (Natural History), London:

Port Jackson, Dr. J. C. Cox, No. 93, 10, 28-36, 7 (2 specimens, 23.5 x 16.5 mm., extended, 25 x 15.5 mm.), No. 93-10-38, 38 (1 specimen, 35 x 27.5 mm.).

GEOGRAPHIC DISTRIBUTION

In the Pacific Ocean from Australia to the Malay Archipelago; Atlantic coast of Africa.

Liolophura hirtosa (Blainville, 1825)

(Text figs. 4, 5c.)

Liolophura hirtosa (*hirtosus*). Ashby, E., 1923, Trans. Proc. Roy. Soc. S. Aust., 47, p. 230; 1926, Rept. Austral. Ass. Adv. Sci., 17, pp. 379-380, 384, 387; 1928, Trans. Proc. Roy. Soc. S. Aust., 52, p. 180; 1929, J. Roy. Soc. W. Aust., 15, p. 52. *Clavarizona hirtosa*. Hull, A. F. B., 1923, Aust. Zool., 3, pp. 199-201 (bibliography and synonymy). Iredale, T., and Hull, A. F. B., 1926, Aust. Zool. 4, pp. 261-262, pl. 37, figs. 9-12, 17, 21. Allan, J., 1950, Australian Shells, p. 239, fig. 56 (10b).

MATERIAL OBSERVED:

Collection of the Institut royal des Sciences naturelles of Belgium:

Western Australia (1 specimen, 32 x 21 mm.). King George's Sound (1 specimen, co-type of *georgianus* Quoy & Gaimard, large valves separated; 2 specimens, 46 x 28.5 mm., and 32 x 26mm., curled up). King Island (1 specimen, co-type of *georgiana* Quoy & Gaimard, 39.5 x 30 mm.).

Fremantle (1 specimen, 52 x 30 mm.). Locality? (2 specimens, largest 40 x 29 mm.).

GEOGRAPHIC DISTRIBUTION:

Southern and Western Australia.

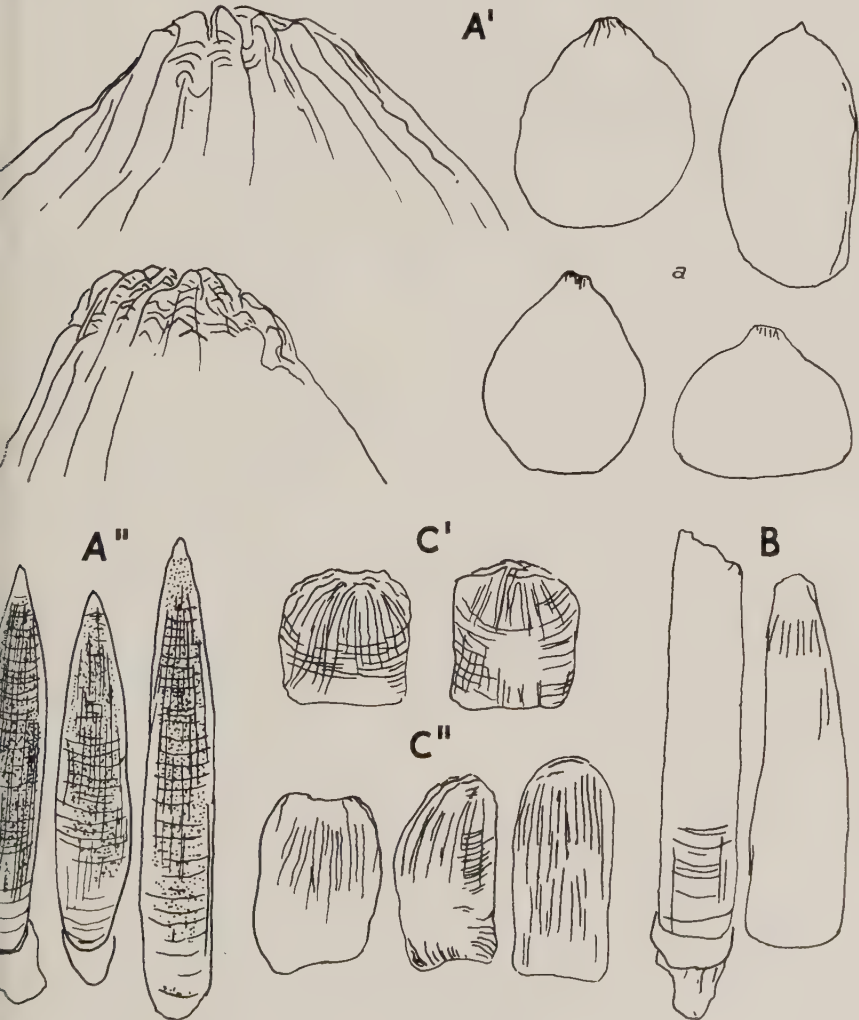


Figure 4: *Liolophura hirtosa* (Blainville, 1825). Girdle Elements: (Mag. x 350, a x 55. A—Upper surface: A1—Scales. A11—Small pigmented spines. B—Marginal edge, scales. C—Lower surface: C1—in the centre, C11—near the marginal edge.

REMARKS.

1. H. Pilsbry (1892) created the var. *tessellata* for the specimens of *L. japonica* which have the upper face of the girdle covered with enlarged spines (text fig. 2); regarding this it must be stated that, in the species *japonica*, spines of this type are subject to notable variation. I had the opportunity of examining two specimens from northern Formosa, the girdles of which carried enormously thick spines. This fact is probably due to an environment rich in limestone, for the valves are likewise strongly encrusted; other specimens from Fokien (China) have similarly thickened and deformed spines, especially those from the lighter coloured zones of the girdle. According to H. Pilsbry, these chitons belong to the variety *tessellata*; however between these specimens with very thick spines, and those with not very thick spines are ranged specimens with spines of intermediate thickness. Thus, there is no well established delimiting point between the two extremes and the variety cannot always be determined very precisely.

In his recent work on the chitons of Mutsu Bay, Isao Taki (1938) makes the same statement and acknowledges the impossibility of separating the varieties of the species.

2. Among the *Liolophura* of different provenances, I have found (E. Leloup, 1939) specimens in which the perinotum bears very abundant spines of uniform length, short, slender, cylindrical, with rounded and white ends; light or dark, they are grouped in alternate regions. This girdle recalls that which is characteristic of *Acanthochiton spiniger*, form *haddoni* Winkworth. The characters of the shell are those of *L. japonica*. This form can be separated under the name *tenuispinosa*, only because of its girdle, its localised habitat in the Indo-Chinese region, and principally because of the lack of specimens with intermediate characters (see E. Leloup, 1939).

3. Among the specimens of *L. japonica* which have been examined, one well-developed specimen was found. The shell, which is in good condition, is of a rather uniform brown colour on the outside of the light coloured bands which extend laterally to the brown jugal band. The valves show, in addition to the structure on the lateral areas of not very numerous and not very regular granules, rather deep grooves delineating longitudinal ribs. On the median areas these ribs are developed mainly on the posterior half of these areas, where they are curved; on the anterior half they have been levelled by erosion and only the lowest parts of the grooves are evident.

4. *L. gaimardi* is known from eastern Australia, and, according to H. Nierstrasz (1905) from Australia to the Indo-Malayan archipelago. Among the Amphineura of the Zoological Museum, Hamburg, there are two specimens from Shikok (Japan); also the Institute royal des Sciences naturelles, Belgium, possesses a specimen from Tonkin. Although they belong to the species *gaimardi*, the characteristics of which they all show, these three specimens are distinguished by the investment of the girdle's upper side, which consists of spines of unequal length, but all considerably enlarged and recumbent. This peculiarity, and the new habitat of the species caused me to regard these specimens as belonging to a new form, *platispinosa* (see E. Leloup, 1939).

5. E. Ashby (1926) very wisely pointed out that the creation of a new genus for the species *L. hirtosa* by A. F. B. Hull (*Clavarizona* Hull.

1923) is hardly justified by the fact that the spines are enlarged in the form of scales on the upper face of the girdle. These elements really do not differ from those of other *Liolophura* except in dimensions, and among the short, enlarged spines of *L. gaimardi platyspinosa*, similar elements can be found. Under strong magnification, they are revealed not as scales covered by ribs on the upper side, but as spines completely sculptured with longitudinal ribs; moreover their arrangement on the girdle is not regular like that of the scales of the Chitoninae and the Ischnochitoninae; their implantation is that of the spines in the sheaths in swellings.

6. In 1894, H. Pilsbry has recognised among specimens of *L. gaimardi*, some of larger size than was previously known for the species, with a uniformly black girdle exhibiting shorter spines than those of the typical *gaimardi* girdle, and he has created for them the variety *queenslandica*. In 1923, A. F. B. Hull redescribed the variety with details of the sculpture which he contrasted with that of typical *gaimardi*. Having admitted that the characters of the sculpture have often deteriorated through erosion and are difficult to recognise, especially in fully grown individuals, he agreed to examine these characters only on juveniles in good condition. The specimens differed only as to the length of the spines; the other characters of the spines and their arrangement remained the same. This single (and not very important) difference does not justify the creation of the variety, a creation which otherwise is not much mentioned in literature.

7. Various authors have expressed their doubts as to the validity of the species *Acanthopleura quatrefagei* Rochebrune, 1881, and regarding its habitat, H. Pilsbry (1893) has placed it among the insufficiently described chitons. R. Sykes (1894) hesitated to include it in his list of Polyplacophora from South Africa. J. Thiele (1909) in his synonymy of certain species of Rochebrune, recognised it as *A. (Liolophura) gaimardi* and he corrected the name *A. quatrefagei* to the latter. However, comparatively recently E. Ashby (1931) placed *A. quatrefagei* in the synonymy of *A. brevispinosa*. The examination of one co-type of *A. quatrefagei* permits me to confirm the opinion of Thiele and has led me to place this species of Rochebrune in the synonymy of *L. gaimardi*, in particular that of its form *platyspinosa*, of which it has the characteristic shape, sculpture, coloration and perinotum.

8. Among the *L. gaimardi* preserved at the Institut royal des Sciences naturelles, Belgium, there is a specimen from "British New Guinea" (fig. 5, B3). Its shape not well developed (22 x 14 mm.), its girdle is covered on the upper side with spines, more tenuous than those of the Australian *L. gaimardi*, and it corresponds to the form *queenslandica*. When disarticulated, valve VIII is seen to have a callus, very superficially but regularly and completely pectinated (fig. 5, B3) with moreover, one deep fissure laterally on the left and two fissures on the right. Because of this conformation, the specimen comes singularly close to the genus *Acanthopleura*. However its not very strong pectination and the irregular fissures constitute rather indefinite characters; moreover the form of the callus and the peculiarities of the perinotum places this chiton with *L. gaimardi*, of which it possesses the form, coloration and sculpture.

9. In one specimen of the species *hirtosa* preserved at the Institut royal des Sciences naturelles, Belgium, but of unknown origin (fig. 5, C1) the valves are eroded to the point of being disarticulated in the median

area; the intervals thus produced are filled up with an unusual growth of the investment of the intervalve prolongations of the perinotum, on which spines are inserted close together, similar to those of the upper side of the girdle but smaller. This fact has been discovered and recorded by P. Dupuis in the Bulletin No. 7 of the Museum d'Histoire naturelle, of Paris, 1917. As indicated briefly in the comparative table, (p. 38), the callus of valve VIII is subject to variation (fig. 5). Smooth, large and flat on a typical *L. gaimardi* (fig. 5, B1), it has pectinations on the lateral regions in typical *L. japonica* (fig. 5, A1), weak and recumbent lamellations on *L. hirtosa* (fig. 5, C1), two lateral fissures next to the pectinated regions on *L. japonica tenuispinosa* (fig. 5, A2) and finally several fissures and pectinated teeth on *L. gaimardi platispinosa* (fig. 5, B2). These observations have been made on a relatively limited number of specimens; it would be interesting if they could be extended to a larger number of specimens. They seem to prove the very close relationship between *Liolophura* and *Acanthopleura*. The degree of relationship is most pronounced among the specimens from areas remote from the range of the

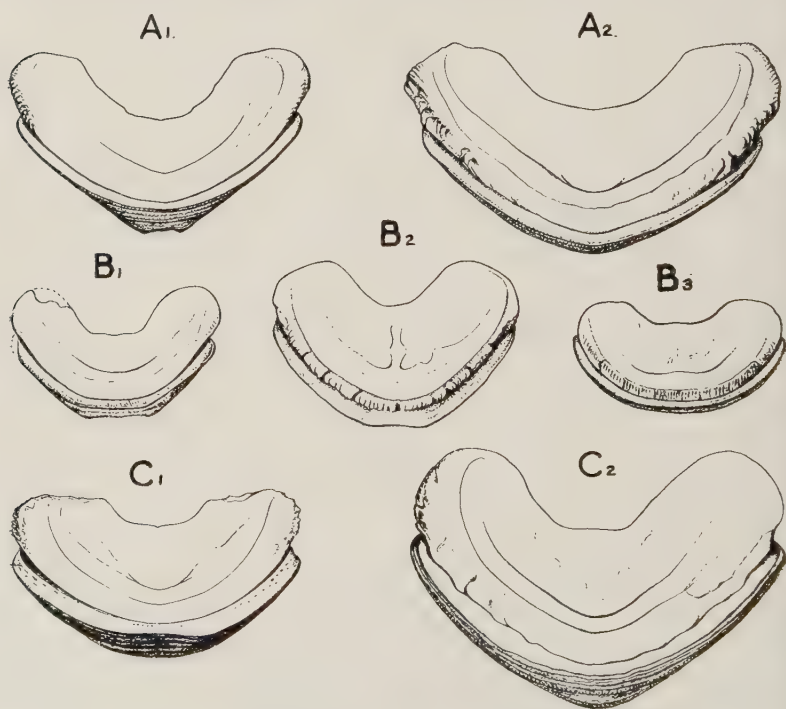


Figure 5: Valve VIII of *Liolophura* spp. Lower surface.

A—*L. japonica* (Lischke, 1837).

A1—Typical, locality unknown. A2—form *tenuispinosa*, Poulou Dama.

B—*L. gaimardi* (Blainville, 1825).

B1—Typical, Australia. B2—form *platispinosa*, Tonkin. B3—form *queenslandica*, British New Guinea.

C—*L. hirtosa* (Blainville, 1825).

C1—Origin unknown. C2—Australia.

typical species: in *L. japonica tenuispinosa* from Indo-China, *L. gaimardi platispinosa* from Japan and Tonkin, *L. gaimardi queenslandica* from "British New Guinea" (= Papua). *L. gaimardi platispinosa* has the posterior valve of an *Acanthopleura*, the fissures of which are more slanting and the teeth shorter; moreover the position of the insertion plate is more turned in and is much exceeded by the tegmentum (fig. 5, B2).

10. *Aesthetes*. *L. japonica* form *tenuispinosa* (Pl. 3, fig. 1). The disposition of the narrow elongated aesthetes (being a terminal macroaesthete accompanied by 5 to 8 microaesthetes rather much elongated) is not very regular. It is influenced by the growth of the tegmentum, for it is rather concentric. Very often the aesthetes are divided into two and these elements emerge at two different levels. On the lateral areas the disposition is even less regular than on the median areas. The extrapigmentary eyes intermingle in great numbers with the aesthetes; it is not uncommon to see two or three adjoining; they are also placed in concentric series.

L. gaimardi (Pl. 3, fig. 2). My observations regarding the structure of the tegmentum were made difficult by the erosion of the valves; however, one specimen of medium size and less damaged, did show aesthetes similar to those of *L. japonica*. Although the presence or the number of microaesthetes was not revealed, the disposition of the aesthetes is rather regular on the jugal regions where they are in level, transverse rows; in the pleural and lateral regions, their disposition is more diffuse and numerous extrapigmentary eyes emerge between the aesthetes. The zones of growth are strongly separated by furrows in which no aesthetes are apparent.

L. gaimardi platispinosa (Pl. 3, fig. 3). A decalcified valve, taken from one specimen in very good condition from Shikok (Japan) showed that the aesthetes are lengthened by ramifying in oval cavities, the extremities of which are turned towards the umbo and allow the macroaesthetes to become level, and from whose circumference the microaesthetes come off, very small, on long peduncles and surrounding the macroaesthetes; the microaesthetes, which are very slender and very easily displaced, generally appear to number about six per aesthete. The aesthetes are rather regularly placed in the median areas, where they are level in transverse rows and often in groups of two or three. On the lateral areas, their disposition is less regular, more or less in quincunx, and cut across by large zones of growth. In the lateral areas and the pleural areas, the extrapigmentary ocelli are level among the aesthetes.

ACKNOWLEDGMENTS:

The assistance of Mr. P. E. Schwerin in translating the article into English and of Mr. F. J. Beeman in preparing the line-drawings is gratefully acknowledged.



PLATE 4.

Figs. 1, 2: *Psammotaea crassula* (Deshayes). Clarence River, N.S.W. Aust. Mus., C 63355. Mag. X1

Fig. 3: *Psammotaea crassula* (Deshayes). Aboriginal campsite, Clarence River, N.S.W. Aust. Mus., C 63356. Mag. X1

NEW SPECIES AND NEW RECORDS OF MARINE MOLLUSCA FROM AUSTRALIA

By DONALD F. McMICHAEL, Ph.D.*

A number of interesting specimens belonging to several groups of marine molluscs have come to hand at the Australian Museum during recent months, some representing new range records, others new species, and for one of the latter, a new genus is necessary.

CLASS BIVALVIA (= PELECYPODA)

FAMILY GARIIDAE

Psammotaea crassula (Deshayes)

(Pl. 4, figs. 1-3.)

Capsa (*Capsella*) *crassula* Deshayes, 1855, Proc. Zool. Soc. London, 1854, p. 349. Reeve, 1857, Conch. Icon., 10, *Capsella*, pl. 2, sp. & fig. 8.

Remarks: While excavating an aboriginal campsite in the Clarence River district near Grafton, N.S.W., Dr. M. L. Ryder of New England University, Armidale, found numerous buried animal remains which were submitted to the Australian Museum for identification. Among them were some mollusca, mostly common species of bivalves from New South Wales still living in the vicinity, but several specimens of a bivalve attracted attention. They were obviously members of the family Gariidae (alternately known as Sanguinariidae or Psammobiidae) but could not be assigned to any recorded Australian species. However comparison with specimens in the collection revealed two shells from the Clarence River, collected by Brazier and obviously living or recently dead specimens when found, which have been overlooked by later workers on the Museum collection.

Brazier had identified the shells as *Capsella crassula* Deshayes, a species described from the Philippines and figured by Reeve; comparison with the figure shows that the Clarence River shells are very similar and they agree well with the description. No dimensions are given by either Deshayes or Reeve, but assuming that Reeve's figure is natural size, the Brazier shells are a little larger, while the campsite shells are about the same size as the type. A somewhat similar species was described by Bertin (1880) as *Hiatula* (*Psammotaea*) *complanata* (p. 100, pl. 5, fig. 3) from unknown locality. This shell is somewhat more slender than the Clarence River specimens, but otherwise agrees closely.

*The Australian Museum, Sydney, N.S.W.

PLATE 4—Continued.

- Fig. 4: *Laticaxis mawae* (Griffith & Pidgeon). 118 fm., off Cape Moreton, Queensland. Aust. Mus. C. 63357. Mag. X1
Fig. 5: *Laticaxis mawae* (Griffith & Pidgeon). Hong Kong. Aust. Mus. C. 38738. Mag. X1
Fig. 6: *Pterynotus patagiatus* (Hedley). Keppel Bay, Queensland. Aust. Mus. C. 63358. Mag. X1
Fig. 7: *Pterynotus patagiatus* (Hedley). Dredged between Bowen and Townsville, Queensland. T. Garrard Collection. Mag. X1
Fig. 8: *Aulicina vespertilio* (Linne). Bathurst Island, Northern Territory. Aust. Mus. C. 63359. Mag. X½
Figs. 9, 10: *Pseudocymbiola provocationis* McMichael. Holotype. Trawled off Ulladulla, N.S.W. Aust. Mus. C. 63182. Mag. X1

The generic name to be used for the species is somewhat doubtful. *Capsella* Deshayes was introduced for a number of similar species, but is preoccupied. Most authors have used *Psammotaea* Lamarck, introduced for eight species in the *Histoire Naturelle*, without designated type species. Dall (1900) reviewing the taxonomy of this group regarded Bowdich (1822) as the first type designator by virtue of the citation of *Psammotaea serotina* Lamarck as example; this would make *Psammotaea* available for the present species and is the accepted usage. However it seems doubtful whether such citations qualify as valid type designations today. The next available is that of Children (1823) who selected quite a different species (*Psammotaea donacina* Lamarck) as type. I am not convinced that the latter is congeneric with *crassula* Deshayes, but for the time being the present species can be left in *Psammotaea*.

CLASS GASTROPODA

FAMILY CORALLIOPHILIDAE

Latiaxis mawae (Griffith & Pidgeon)*

(Pl. 4, figs. 4, 5.)

Pyrula mawae Griffith & Pidgeon, 1834, Cuvier's Animal Kingdom, 12, pl. 25, figs 3, 4, p. 599.

Latiaxis mawae. Swainson, 1840, Treatise on Malacology, pp. 82, 306.
Kira, 1955, Coloured Illustrations of the Shells of Japan, pl. 25, fig. 26.

Remarks: The occurrence of this well known species on the eastern Australian coast is astounding, in view of the restricted distribution which the species was previously thought to enjoy. A single, dead and somewhat worn specimen was received from Mr. W. Lillistone of Brisbane, who kindly presented it to the Australian Museum. It was dredged in 110 fathoms, off Cape Moreton, and probably was collected by m.v. "Challenge". The shell compares well with Japanese specimens of *L. mawae* in the Australian Museum collection, though the photograph on plate 4, fig. 4 will show that it differs somewhat in the descent of the whorls, when compared with a typical Japanese shell (pl. 4, fig. 5), though there is some variation in this feature among Japanese specimens. The angle of protrusion of the encircling flat spines at the shoulder of the whorl is different in the Australian specimen, being more-or-less horizontal (if the shell be held with the axis vertical) whereas the Japanese shells nearly always have the spines curling upwards. However, these differences are not sufficient to warrant specific separation of the Australian shell in view of its otherwise close resemblance to *Latiaxis mawae*. (It should be pointed out that the differences between the Japanese coralliophilid *Tolema lischkeana* (Dunker) and the Australian *Tolema australis* Laseron, are much the same as those indicated above, especially the angle of protrusion of the shoulder spines from the body whorl.)

*Two live specimens of this species were dredged in Western Australian waters by the Hawaiian-West Australian Expedition in June, 1960.

The generic allocation of species of the family Coralliophilidae is not satisfactory at present and much revision is necessary. However the present species, being the type species of *Latiaxis* is correctly located therein.

FAMILY MURICIDAE

Pterynotus patagiatus (Hedley)

(Pl. 4, figs. 6, 7.)

Murex patagiatus Hedley, 1912, Rec. Aust. Mus., 8, p. 151, pl. 43, fig. 36.

Remarks: This lovely muricid has been found in numbers during recent years by trawling and dredging at various localities in Queensland. Its determination proved difficult, as it resembled a miniature species of the "*pinnatus*" group but did not match any known Queensland or tropical species. However, comparison with the species described by Hedley from New South Wales as *Murex patagiatus*, revealed a very close affinity; the southern shell is almost completely lacking in the foliated expansion of the varices, characteristic of the northern specimens, but otherwise the two forms are almost identical. When naming *patagiatus*, Hedley referred to a couple of specimens, rather beachworn, from Ballina, north New South Wales, but selected as holotype a shell from Sydney Harbour, dredged by Brazier. Study of the type series in the Australian Museum shows that the two beachworn shells are not the same species as the holotype, but are in fact worn specimens of *Torvamurex denudatus*. A few specimens of *patagiatus* from Queensland (Lindeman Island, North West and Masthead Islands) were located in the Australian Museum collection, but these were all dredged and imperfect specimens. A pair of clean, live shells were sent by Mr. and Mrs. R. Brown, of Yeppoon, Queensland, to Mr. T. Garrard, who passed them on to the Museum for identification. They differ slightly from the holotype in having a somewhat more elongate shell, with the foliate varices very well developed and with a longer siphonal canal. However the type of *M. patagiatus* is a dead shell, and while it lacks the well developed foliation of the varices, these could have been worn away. It is however a more squat shell, but without additional material from New South Wales it is not possible to separate the two forms. Conceivably the Queensland shells could represent a northern subspecies, but for the time being they are referred to *patagiatus*. The Keppel Bay shells are pinkish white in colour, but specimens from further North, dredged between Bowen and Townsville are a bright orange-pink between the varices.

The generic name to be used for the species is apparently *Pterynotus* Swainson (type species *pinnatus* Swainson) and *patagiatus* Hedley has many affinities with the type. Generic divisions in the Muricidae are far from well established however and the name is used with some reservation as there seems to be almost continuous variation in this family from genus to genus. Hedley compared his species with *Murex denudatus*, but the comparison was probably the result of his having confused two worn specimens of that species with his new species. In fact *Murex denudatus* is in no way similar to the present form.

FAMILY VOLUTIDAE

Aulicina vespertilio (Linne)

(Pl. 4, fig. 8.)

Voluta vespertilio Linne, 1758, Syst. Nat., Ed. 10, p. 733, Vermes Testacea sp. 371. Reeve, 1849, Conch. Icon., 6, *Voluta*, pl. 5, sp. & fig. 11.

Remarks: The range of this species has till now been known to extend from the Philippines through the eastern Islands of Indonesia to the north coast of New Guinea, but to my knowledge it has never been recorded from the southern coast of New Guinea and certainly not from Australia. Specimens are now to hand from Bathurst Island, off the north-west tip of Arnhem Land, collected by Mr. C. F. Kurtze of Portland, Victoria, and presented to this Museum by Mrs. D. I. Hartley. At first sight, the shells appear to differ somewhat from normal populations of the species, but comparison with the figures in Reeve show that they agree closely in form with shells figured by Reeve as "typical" *vespertilio*, differing only in coloration, which in the Bathurst Island shells is uniformly streaked longitudinally with dark brown on a cream shell.

PSEUDOCYMBIOLA gen. nov.

Type Species: *Pseudocymbiola provocationis* sp. nov.

Remarks: Among some shells collected by m.v. "Challenge" off the south coast of New South Wales were a couple of volutes which at first sight, resembled discoloured specimens of some form of *Cymbiolacca*. However closer examination revealed that they had nothing whatever to do with *Cymbiolacca*, differing in the structure of the protoconch. One shell was obtained from the master of "Challenge", Mr. Evans Paddon, and the other from Mr. T. Garrard who kindly handed their shells to me for description. The relationship of these two shells is seen at once when a number of Tertiary species of volutes from southern Australia are studied. These species, including the forms described as *Voluta weldi* Tenison-Woods, *Voluta strophodon* McCoy and *Voluta strophodon brevissima* Pritchard (but not necessarily all the species listed by Cotton (1949) as *Cymbiola*) show a close resemblance to the present species in general form and more particularly in the protoconch which is comparatively small, hemispherical, white, quite smooth, of about $2\frac{1}{2}$ whorls and merges without a break into the juvenile whorls.

In body form the shells fall into the general volutid pattern of moderately long spire, spinose shouldered whorls, several strong columellar plaits and a well developed basal fasciole. The generic name adopted above indicates that in some general features these shells recall members of the genus *Cymbiola* s.l. but the latter group has a flattened, ribbed protoconch and the shells are generally much larger species.

It would appear that the new, living species to be described below, is the present-day derivative of the Tertiary *strophodon* group, which probably represents an old Australian element in the Tertiary fauna, whereas the genus *Cymbiola* (and *Aulica* which is often grouped with it) probably is part of the Tethyan element in our fauna, from which most of the present Indo-Pacific tropical species derive.

Pseudocymbiola provocationis sp. nov.

(Pl. 4, figs. 9, 10.)

Description: Shell of medium size, maximum length 45 mm., maximum diameter 22 mm., spire elevated, body whorl large, aperture 32 mm. in length. Protoconch comparatively large, rounded, creamish-white, of $2\frac{1}{2}$ whorls, with faint, spiral striations, merging imperceptibly into the adult whorls which number $3\frac{1}{2}$. Spire slightly nodulose, the nodules increasing in size on the penultimate whorl and fully developed on the body whorl, where they form a crown at the shoulder of the whorl; nodules sharply pointed, outstanding, numbering from five to seven on the body whorl. Colour of shell orange-fawn, with faintly orange patches clouding the spire and body whorl and a few scattered dots of orange brown, mostly obscure, with a series of short, vertical, orange-brown lines below the suture, spaced about one mm. apart and scarcely one mm. in length. Aperture white in colour, with a thin white opaque callus across the inner lip and continuing onto the basal fasciole. Four strong columellar plications.

Types: The holotype is the larger of the two specimens available, and was trawled off Ulladulla, N.S.W. It is in the Australian Museum, Registered No. C. 63182. A paratype from off Port Kembla, N.S.W., has been presented to the National Museum of Victoria, Melbourne.

Paramoria weaveri sp. nov.

(Pl. 5, top figs.)

Remarks: The following new species was collected last year by the Hawaiian-Western Australian expedition which carried out dredging operations along the southern half of the Western Australian coast during May and June, 1960, in the yacht "Davina". It is proposed to report fully on the collections of Volutidae made by the expedition at a later date, but the present species is of particular interest and I have been asked to expedite its description. The shell was tentatively identified as *Nannamoria guntheri* (Smith) but comparison with specimens in the Australian Museum and study of the original description and figure show that it is quite a different species. The new form is small, but apparently adult and resembles *guntheri* in shape, though the spire is more depressed and the whorls more shouldered. The colour pattern is of a generally similar type, but the arrangement of the chestnut lines is distinctive. For these reasons, it is described as a new species of the genus *Paramoria* McMichael, recently proposed by me for *guntheri* Smith, (*Journ. Malacol. Soc. Australia*, 4, p. 12).

Description: Shell small, 27 mm. maximum length, 14.5 mm. maximum diameter, aperture 24 mm. in length. Body whorl large, spire short, whorls shouldered and sharply nodulose, aperture gaping, inner lip with four columellar plaits. Protoconch comparatively large, of $3\frac{1}{2}$ whorls, quite smooth, pale fawn in colour with the exception of a narrow band of white encircling the protoconch whorls just below the suture. Adult whorls $2\frac{1}{2}$, pinkish cream, longitudinally striped with fine chestnut-brown lines; most of the lines not continuous, but breaking off abruptly and replaced by lines which run parallel to them for short distances; a few lines continuous from top to bottom however. Lines clumped together at intervals and thickened, giving an impression of a series of blotches of colour, occurring in two bands encircling the shell, one about 5 mm. below shoulder, the

other some 10 mm. below that. Whorls shouldered, becoming nodulose, the nodules sharply pointed, but not produced into spines, numbering 9 or 10 on the body whorl.

Animal with a broadly expanding foot, cream to yellowish in colour, brilliantly patterned with a lattice of orange lines and reticulations.



—Block by courtesy of the Royal Zoological Society of New South Wales.

PLATE 5.

Top three figures: *Paramoria weaveri* McMichael. Holotype. Bishop Museum No. 213874.

Bottom two figures: *Paramoria guntheri* (Smith). Encounter Bay, South Australia. Australian Museum No. C. 62111.

Proboscis banded with orange; tentacles and lateral lobes of head crossed by fine brown lines. In alcohol, all colours faded, except the brown lines on the tentacles and head lobes. Siphon short, with comparatively long appendages, which are expanded distally. Tentacles long, with broad lobes beside them, the eyes prominent at the bases of the tentacles. Fleshy hood above the proboscis white, its margin fimbriated. Radula uniserial, with about 205 Y-shaped teeth, each approximately 0.158 mm. by 0.105 mm., the arms of the Y long and slender, the cusps short, slender and sharply tapering.

Type Locality: Zeewyck Channel, Abrolhos Islands, dredged in 80 fathoms, 12th May, 1960.

Types: The unique holotype, including the dissected animal and radula slide, is in the Bernice P. Bishop Museum, Honolulu, Catalogue No. 213874.

Additional Remarks: The species is named for Mr. Clifton Weaver, President of the Hawaiian Malacological Society who collected the specimen and made the colour notes on the living animal, details of which have been given above.

The shell is in many ways a miniature of *P. guntheri*, (Pl. 5, bottom two figures) but it differs in being markedly smaller, in the more pronounced undulation of the lines and in details of the shape of the shell. These differences are clearly illustrated in the accompanying figures. The presence of a radula in the holotype of *P. weaveri* enables the affinity of the genus *Paramoria* to be determined for the first time. The Y-shaped radular teeth place it in the subfamily Scaphellinae, and it must stand next to *Cymbiolista* Iredale and *Amoria* Gray.

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NOTES AND RECORDS

Another Poisonous Octopus Bite.

Some years ago I recorded* a poisonous bite by the common Ringed Octopus (*Hapalochlaena maculosa*) which occurred in the Wollongong District of New South Wales. On that occasion, there was no *direct* evidence that the bite had been by the Octopus, though the circumstantial evidence was very strong. Confirmation of the poisonous nature of the bite of this small species has now been received, from Mrs. L. Masters, of Swansea, New South Wales (at the entrance to Lake Macquarie). Mrs. Masters reports that a young boy was bitten on the hand by one of these Octopus and shortly afterwards complained that he was not feeling well and went home. He drank a glass of water, but immediately complained to his parents that he was sick. He lost all co-ordination of his limbs, his speech became thick and he kept saying that he could not breathe. His skin became very cold and clammy and vomiting set in. At intervals there was spasmodic jerking of the limbs. These symptoms persisted for some hours. Gradually, after about eight hours, his speech returned to normal, then his arms recovered, but it was a couple of days before he could walk without assistance. These symptoms are almost exactly the same as those reported by the man bitten at Wollongong, and they emphasise the extreme virulence of the neurotoxin produced by this species. Extreme care should therefore be exercised when handling this Octopus, which may well be capable of inflicting a fatal bite on a susceptible individual.

Donald F. McMichael.

*McMichael, D. F., 1957, Proc. Roy. Zool. Soc. N.S.W., 1955-56, p. 110.

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